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Syllabus of the competitive examination to be conducted through the Commission for appointment to the post of Dentist under Bihar Dentists Services.

Name of Post	–	**Dentist**
Type of Examination	–	**Objective Type (Computer Based Test)**
Time Duration	–	**02:00 Hours**
Number of Questions	–	**100**
Total Marks	–	**400 Marks**
Marks for Each Right Answer	–	**04 Marks**
Negative Marks for Each Wrong Answer	–	**01 Mark**

Question will be asked under following syllabus :

1. **DENTAL MATERIALS**
2. **ORAL PATHOLOGY**
3. **ORAL & MAXILLOFACIAL SURGERY**
   a. Exodontia (Tooth Extraction)
   b. Minor Oral Surgical Procedures.
   c. Traumatic injuries of the Face and Jaws.
   d. Management of Medical emergencies in Oral Surgery.
4. **PEDODONTICS :**
   a. Dental Caries (Early Childhood caries, rampant caries).
   b. Flourides
   c. Oral habits in children and their Management
   d. Management of medically compromised Patients.
5. **PERIODONTOLOGY**
   a. Gingival enlargement,
   b. Aggressive Perodontitis,
   c. Necrotizing Periodontal disease
   d. Periodontal and Gingival Abscess.
   e. Splint in Periodontal Therapy

6. **PUBLIC HEALTH DENTISTRY**
    a. Preventive Dentistry
    b. Indices in Dental Epidemiology
    c. School Oral Health Programme
7. **CONSERVATIVE DENTISTRY AND ENDODONTICS**
    a. Dental Caries
    b. Fundamentals of Tooth Preparation and Pulp Protection.
    c. Restorations in Dentistry and Restorative Material
    d. Vital Pulp Therapy/Pulpotomy/Apexification

8. **ORTHODONTICS**
    a. Growth and Development
    b. Occlusion and Malocclusion

9. **PROSTHODONTICS AND CROWN & BRIDGE**
    a. Complete Denture
    b. Removable Denture
    c. Fixed Partial Denture

10. **ORAL MEDICINE AND RADIOLOGY**
    a. Pre Malignant Lesion & Condition
    b. Oral cancer
    c. Systematic Diseases with Oral manifestations
    d. Oral radiology- Radiation Physics, radiographic Technique, Interpretation, Radiation Therapy

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CHAPTER 01

DENTAL MATERIALS

1. Which term best describes the scientific study of the composition and properties of materials used in dentistry and their application in dental practice?
   (A) Dental Metallurgy
   (B) Dental Materials Science
   (C) Biomimetics
   (D) Prosthodontic Science

2. Which of the following describes the primary reason dental materials require biocompatibility?
   (A) To reduce manufacturing cost
   (B) To ensure ease of handling
   (C) To prevent harmful tissue reactions
   (D) To facilitate faster placement

3. Which statement best explains why an understanding of both physical and chemical properties is essential for selecting a dental restorative material?
   (A) Physical properties alone determine durability
   (B) Chemical properties alone determine esthetics
   (C) Physical and chemical properties together define overall performance
   (D) Neither physical nor chemical properties directly affect longevity

4. All the following are desirable physical properties of a dental material except:
   (A) High compressive strength
   (B) Low coefficient of thermal expansion
   (C) Low solubility
   (D) Rapid galvanic corrosion rate

5. Compared to metals used in dentistry, which major advantage do polymer-based restorative materials typically offer?
   (A) Greater tensile strength
   (B) Better color matching
   (C) Higher melting points
   (D) Lower polymerization shrinkage

6. When selecting a restorative material for a posterior restoration in a high-load bearing area, which factor should be prioritized?
   (A) Esthetics above all
   (B) Low modulus of elasticity for flexure
   (C) High compressive strength and wear resistance
   (D) Rapid setting time regardless of properties

7. A clinician plans to restore a fractured incisor in a patient seeking an aesthetic result. Which dental material property is most essential?
   (A) High opacity
   (B) Excellent esthetic match
   (C) High thermal conductivity
   (D) Low bond strength

8. What is the term for the minimal thickness a material must possess to resist permanent deformation when subjected to stress?
   (A) Elastic limit
   (B) Proportional limit
   (C) Yield strength
   (D) Fatigue strength

9. Which property measures a material's resistance to indentation or scratching?
   (A) Hardness
   (B) Malleability
   (C) Ductility
   (D) Resilience

10. Why is the coefficient of thermal expansion (CTE) so important in dental restorations?
    (A) It prevents setting time changes

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(B) It matches saliva pH
(C) It influences color stability
(D) It affects marginal seal with tooth structure

11. All the following are basic chemical properties to consider in dental materials except:
(A) Corrosion susceptibility
(B) Setting reaction type
(C) Water sorption
(D) Radio-opacity

12. In comparing glass ionomer cements (GIC) with resin composites, which advantage is typical of GIC?
(A) Superior esthetic matching
(B) Fluoride release
(C) Better polishability
(D) Greater bond strength to enamel

13. When selecting a material for a class V cervical restoration in a high caries-risk patient, which material property should be a priority?
(A) Maximum compressive strength
(B) Fluoride-releasing capability
(C) Highest translucency
(D) Low surface hardness

14. A clinician faces difficulty achieving moisture control when placing a restoration on a posterior tooth. Which restorative material is most likely to be compromised by moisture contamination during placement?
(A) Glass ionomer cement
(B) Composite resin
(C) Gold foil
(D) Dental amalgam

15. Which of the following steps, if performed incorrectly, most commonly leads to reduced durability of a composite restoration?
(A) Inadequate tooth isolation
(B) Excessive finishing and polishing
(C) Proper light-curing exposure
(D) Incremental placement of material

16. What is the primary effect of incorporating filler particles into a resin matrix in composite restorations?
(A) Increased solubility
(B) Enhanced surface roughness
(C) Improved mechanical strength
(D) Decreased working time

17. Which component in dental amalgam primarily provides strength?
(A) Mercury
(B) Silver
(C) Tin
(D) Copper

18. Why is condensation critical during the placement of dental amalgam?
(A) It reduces color mismatch
(B) It helps remove excess mercury
(C) It increases setting time
(D) It ensures polymerization shrinkage

19. All the following are true about high copper amalgams except:
(A) They exhibit improved corrosion resistance
(B) They contain more than 6% copper
(C) They reduce the gamma-2 phase
(D) They possess lower strength than low copper amalgams

20. How do conventional glass ionomer cements differ primarily from resin-modified glass ionomer cements?
(A) Conventional versions have a resin component
(B) Resin-modified versions release no fluoride
(C) Resin-modified versions require light curing
(D) Conventional versions cannot bond to dentin

21. In a patient with a moderate caries rate and a desire for a tooth-colored restoration in a premolar, which material can offer both fluoride release and improved esthetics compared to conventional GIC?
(A) Amalgam

(B) Pure acrylic resin
(C) Resin-modified glass ionomer cement
(D) Dental gold alloy

22. When placing a glass ionomer restoration, which key action promotes better adhesion to the tooth structure?
(A) Etching with phosphoric acid for 60 seconds
(B) Conditioning the tooth surface with polyacrylic acid
(C) Applying a resin bonding agent on top of GIC
(D) Light curing immediately without waiting

23. Which is the main effect of moisture contamination when placing a glass ionomer cement restoration?
(A) Decreased working time
(B) Formation of weaker matrix
(C) No effect on final set
(D) Enhanced fluoride release

24. A patient complains about sensitivity in a newly placed composite restoration. Which liner or base is most often recommended beneath composite to reduce sensitivity?
(A) Zinc oxide eugenol
(B) Polycarboxylate cement
(C) Calcium hydroxide liner
(D) Zinc phosphate cement

25. Why are bonding agents crucial for composite restorations?
(A) They provide color stability
(B) They eliminate microleakage completely
(C) They improve adhesion between tooth and composite
(D) They only shorten the procedure time

26. A dentist is placing a composite restoration. Which incorrect step is most likely to cause incomplete polymerization?
(A) Using short increments of composite
(B) Prolonged curing time with correct wavelength
(C) Increment thickness exceeding recommended depth
(D) Proper isolation during placement

27. How does a flowable composite generally differ from a packable composite?
(A) Higher filler content in flowable composites
(B) Lower viscosity in flowable composites
(C) Better compressive strength in flowable composites
(D) Shorter working time in flowable composites

28. What is the primary effect of high filler content in composite resins?
(A) Decreased compressive strength
(B) Reduced wear resistance
(C) Increased thermal expansion
(D) Reduced polymerization shrinkage

29. In placing a composite resin restoration for a pediatric patient with poor isolation, which additional step might improve the success of bonding?
(A) Using a universal self-etch adhesive
(B) Completely skipping etching
(C) Choosing a high-copper amalgam instead
(D) Heating the composite before placement

30. Which key feature makes resin-based liners (e.g., flowable composites) advantageous beneath posterior composites?
(A) They transmit high stresses
(B) They prevent polymerization
(C) They absorb some shrinkage stresses
(D) They increase thermal conductivity

31. A 28-year-old patient with minimal interproximal decay requests an aesthetic restoration. The dentist selects a microfilled composite. Which property of microfilled composites often prompts this choice?
(A) Enhanced polishability
(B) Superior fracture resistance
(C) Increased filler content
(D) Stronger compressive strength

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32. A patient complains of slight thermal sensitivity following a Class II composite restoration placed without a base. Which property of composite resin might contribute to thermal sensitivity?
(A) High thermal conductivity
(B) Low elastic modulus
(C) Resin porosity
(D) Low coefficient of thermal expansion

33. A 35-year-old with a fractured Class IV restoration complains of discoloration and roughness. Examination reveals microleakage and compromised resin margins. Which is the best intervention?
(A) Polish existing restoration
(B) Replace restoration with composite
(C) Use fluoride varnish
(D) Place a ceramic veneer

34. A 40-year-old patient has extensive cervical abrasion lesions. Glass ionomer restorations placed previously show marginal breakdown, possibly from abrasive brushing. Which property of RMGIC might better withstand this environment?
(A) Enhanced modulus of elasticity
(B) Minimal bond strength
(C) Increased brittleness
(D) Better wear resistance

35. Assertion: High-copper amalgams are clinically preferred over low-copper versions.
Reason: High-copper amalgams exhibit reduced gamma-2 phase, improving strength and corrosion resistance.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

36. Which liner/base is often used under amalgam restorations to protect the pulp from thermal conductivity?
(A) Zinc phosphate base
(B) Zinc polycarboxylate
(C) Glass ionomer base
(D) Resin adhesive only

37. Which protocol is best practice to reduce microleakage at the margins of a composite restoration?
(A) Place composite in bulk
(B) Employ a total-etch and bonding procedure
(C) Skip bonding if enamel is beveled
(D) Allow saliva to moisten tooth surface

38. A patient experiences persistent postoperative sensitivity after a composite filling. Which red-flag symptom might indicate a failing bond or microleakage?
(A) Transient sensitivity to sweets only
(B) Sensitivity improving over time
(C) Momentary discomfort upon biting
(D) Prolonged pain with thermal changes

39. Which key symptom typically alerts the dentist to a marginal breakdown in an amalgam restoration?
(A) Quick fading sensitivity
(B) Visible tarnish on surface
(C) Recurrent caries at restoration margin
(D) Bright shine on occlusal surface

40. Assertion: Composite restorations require incremental placement.
Reason: Incremental placement minimizes the risk of shrinkage gaps.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

41. A deep carious lesion is being restored with composite. Dentinal tubules are close to the pulp. Which management decision helps protect the pulp?
(A) Use zinc oxide eugenol base directly under composite

(B) Place a calcium hydroxide liner prior to bonding
(C) Skip all liners to avoid layering
(D) Use a thermal metallic liner

42. Which test best measures the wear resistance of a composite material in a simulated oral environment?
(A) Vickers hardness test
(B) Compressive strength test
(C) Thermocycling with pH cycling
(D) Three-body wear test

43. A 55-year-old patient has a large MOD composite restoration that has chipped at the marginal ridge. The dentist notes poor bonding technique originally. After removing defective material, which step is critical to ensure better ridge strength and reduced shrinkage stress during the new restoration?
(A) Bulk-fill placement
(B) Packable composite with incremental layering
(C) High-copper amalgam replacement
(D) No-liner approach

44. A 42-year-old patient presents with a fractured cusp on a lower molar. The existing amalgam restoration is 12 years old, discolored, and has recurrent decay at the margins. Occlusal forces are high, and the patient desires a long-lasting solution. Clinical examination confirms enough tooth structure remains to support a direct restoration. Which restorative material is most appropriate given the heavy occlusal load, the patient's desire for some esthetics, and a need for improved longevity?
(A) Conventional composite
(B) High-copper amalgam
(C) Hybrid composite resin
(D) Glass ionomer cement

45. Which is the best way to minimize postoperative sensitivity in a deep composite restoration?
(A) Omit bonding agent to reduce shrinkage
(B) Bulk-fill to reduce the number of increments
(C) Use a compatible liner or base and proper bonding
(D) Shorten curing times

46. Which key feature of newer bulk-fill composites aids in minimizing shrinkage stress?
(A) Extremely high filler content alone
(B) Special photoinitiators allowing deeper curing
(C) Absence of any matrix resin
(D) Immediate finishing and polishing

47. After removing caries in a molar, the dentist places a base over a near-pulpal exposure, then applies adhesive. Which type of base is often chosen to reduce thermal conductivity?
(A) Glass ionomer
(B) Zinc oxide eugenol
(C) Resin cement
(D) Polyurethane

48. A child presents with a large Class I carious lesion in a primary molar. Moisture control is difficult. The dentist decides on a restorative material that tolerates moisture and releases fluoride. Which material is most suitable?
(A) Composite resin
(B) Glass ionomer cement
(C) Zinc phosphate cement
(D) Amalgam

49. Which step, if incorrectly performed, most likely reduces the fluoride release from a traditional glass ionomer restoration?
(A) Over-conditioning with polyacrylic acid
(B) Proper mixing ratio
(C) Use of varnish after initial setting
(D) Incremental placement

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50. A 60-year-old patient complains of an old Class II amalgam restoration fracturing at the isthmus. Radiographs reveal secondary caries. The dentist decides to replace the restoration with a well-bonded material that conserves tooth structure. The patient demands improved esthetics yet requires strength for heavy occlusal forces. After removing caries, which restorative option best satisfies strength and esthetic demands in one procedure?
(A) Regular glass ionomer
(B) Amalgam core with crown
(C) Hybrid composite
(D) Gold inlay

51. Which term refers to the negative replica of oral structures, used to produce a positive cast or model in dentistry?
(A) Cast
(B) Impression
(C) Articulator
(D) Die

52. Which is the primary constituent of irreversible hydrocolloid (alginate) that ensures setting into a gel form?
(A) Silicon dioxide
(B) Potassium alginate
(C) Calcium sulfate dihydrate
(D) Borax

53. Why is syneresis a concern with hydrocolloid impression materials?
(A) It makes the set impression too rigid
(B) It can cause water absorption leading to swelling
(C) It leads to water loss and dimensional changes
(D) It improves tear resistance

54. All of the following are advantages of alginate over other impression materials except:
(A) Low cost and simplicity
(B) Highly accurate detail reproduction for crown margins
(C) Pleasant handling properties
(D) Adequate working time for many clinical scenarios

55. How do elastomeric impression materials generally differ from hydrocolloids?
(A) They exhibit lower dimensional stability
(B) They cannot be used for crowns and bridges
(C) They usually have superior tear strength and accuracy
(D) They require immediate pouring with gypsum

56. A dentist needs a highly accurate, dimensionally stable impression for a complex, multiple-unit fixed prosthesis. Which material is most suitable?
(A) Irreversible hydrocolloid (alginate)
(B) Polyvinyl siloxane (PVS)
(C) Impression compound
(D) Inelastic plaster

57. A patient presents with multiple undercuts. Which impression material is best at accurately capturing these details without tearing during removal?
(A) Plaster of Paris
(B) Zinc oxide eugenol paste
(C) Polysulfide rubber
(D) Compound

58. In elastic impression materials, which property describes the ability of the set material to return to its original dimensions after deformation?
(A) Working time
(B) Recovery from deformation
(C) Flow rate
(D) Wettability

59. Which impression material is known for having a distinctive sulfur-like odor and requiring custom trays due to its comparatively high flow?
(A) Polyether
(B) Polysulfide
(C) Addition silicone
(D) Reversible hydrocolloid

60. Why are stock metal trays generally unsuitable for polyether impressions in cases of large arch coverage?
(A) Metal trays cause allergic reactions with polyether
(B) Polyether sets too slowly in metal trays
(C) Polyether is dimensionally rigid and requires a tray with uniform spacing
(D) Stock trays contaminate the polyether reaction

61. All the following steps help minimize bubbles and voids in elastomeric impressions except:
(A) Controlling saliva with adequate isolation
(B) Injecting wash material first around critical areas
(C) Vigorously shaking the tray after material loading
(D) Seating the tray steadily without abrupt pressure

62. How do reversible hydrocolloids differ from irreversible hydrocolloids regarding their mechanism of setting?
(A) Reversible hydrocolloids harden by chemical cross-linking
(B) Irreversible hydrocolloids set by temperature changes only
(C) Reversible hydrocolloids change from sol to gel upon cooling
(D) Irreversible hydrocolloids can be heated to revert to a sol

63. For a patient with subgingival crown margins, which impression technique/material combination often yields the most accurate gingival sulcus capture?
(A) Single-mix alginate impression
(B) Double-cord retraction with polyvinyl siloxane
(C) Impression compound without gingival displacement
(D) Non-eugenol paste with universal tray

64. A dentist needs an impression of a highly mobile edentulous ridge for a complete denture. Which material characteristic is essential?
(A) High rigidity
(B) Long setting time
(C) Good tissue tolerance and detail reproduction
(D) Excessive hydrophobicity

65. Which incorrect step can most compromise the accuracy of an agar reversible hydrocolloid impression?
(A) Storing the impression in a humid environment before pouring
(B) Maintaining water bath temperatures within recommended ranges
(C) Prolonged delay in pouring the impression
(D) Rapid cooling from sol to gel

66. What is the likely outcome if an elastomeric impression is stored improperly in a hot, dry environment for several days before pouring?
(A) Improved dimensional accuracy
(B) No change in properties
(C) Potential shrinkage or distortion
(D) Enhanced tear resistance

67. Which primary effect does a hydrophilic impression material, such as polyether, have on impression accuracy?
(A) Decreased ability to capture details in moist conditions
(B) Greater affinity for water, improving flow around wet tissues
(C) Faster set under dry environments
(D) Higher polymerization shrinkage

68. A 63-year-old patient with extensive crown preparations on multiple molars needs a precise final impression. The clinical situation allows excellent isolation, but subgingival margins are tight. Which impression material typically offers highest dimensional stability for this indication?
(A) Condensation silicone
(B) Addition silicone (PVS)
(C) Alginate hydrocolloid
(D) Compound

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69. A lab reports internal voids on a cast from a dentist's impression for a 3-unit fixed bridge. Which impression issue is most likely to have caused these voids?
(A) Thorough syringe application of low-viscosity material
(B) Air entrapment from improper syringe/tray material blending
(C) Use of monophase technique in a custom tray
(D) Delayed pouring of a stable elastomer

70. A dentist sees slight tearing of impression material at the gingival margin. Which step is the best immediate management to improve margin capture on the next impression?
(A) Increase the tray size
(B) Use a stiffer impression material
(C) Place gingival retraction cord and isolate thoroughly
(D) Reduce the setting time by using warm water

71. Which term describes the process by which a luting agent fills the interface between a fixed prosthesis and tooth, creating a retention seal?
(A) Acid-etching
(B) Cementation
(C) Cohesion
(D) Sintering

72. Which dental cement is known for an exothermic setting reaction and requires careful mixing on a cooled glass slab?
(A) Zinc phosphate cement
(B) Zinc polycarboxylate cement
(C) Glass ionomer cement
(D) Resin cement

73. Why might zinc polycarboxylate cement be preferred over zinc phosphate for a patient with exposed dentinal tubules and sensitivity concerns?
(A) It has a highly acidic pH that soothes pulp
(B) It releases eugenol to sedate pulp
(C) It chemically bonds to tooth structure, reducing microleakage
(D) It sets faster with more exotherm

74. All of the following are advantages of glass ionomer luting cement except:
(A) Chemical adhesion to tooth structure
(B) Fluoride release for caries protection
(C) Ability to bond well in a wet field
(D) Extremely high compressive strength matching amalgam

75. How do resin cements generally differ from conventional zinc phosphate and glass ionomer cements?
(A) Resin cements provide no bond to tooth structure
(B) Resin cements are always water-based
(C) Resin cements often demonstrate higher strength and lower solubility
(D) Resin cements set exothermically like zinc phosphate

76. When cementing an all-ceramic crown with minimal retention form, which cement provides a strong bond to both tooth and ceramic?
(A) Zinc polycarboxylate cement
(B) Resin-modified glass ionomer cement
(C) Conventional glass ionomer cement
(D) Adhesive resin cement

77. A dentist uses a porcelain-fused-to-metal crown with metal margins. Which characteristic of resin-modified glass ionomer cement is beneficial in this scenario?
(A) Eugenol release to sedate the pulp
(B) Light-cure only property
(C) Fluoride release with acceptable strength
(D) Inability to bond to metal

78. Which term describes the neutralization reaction between a powder of zinc oxide and a liquid polyacrylic acid in dentistry?
(A) Hydration reaction
(B) Acid-base reaction
(C) Oxidation reaction
(D) Addition polymerization

79. Which cement commonly includes eugenol in its liquid component and can soothe inflamed pulp?
(A) Zinc oxide eugenol cement
(B) Polycarboxylate cement
(C) Glass ionomer cement
(D) Resin cement

80. Why must zinc oxide eugenol not be used routinely under resin-based restorations?
(A) It has too high compressive strength
(B) It permanently stains composites
(C) Eugenol can inhibit the resin polymerization
(D) It is overly acidic

81. All the following are potential clinical uses of glass ionomer cement except:
(A) Luting crowns and bridges
(B) Restoring Class I high-stress cavities in posterior teeth
(C) Lining under composite restorations
(D) Cervical lesion restorations in non-load bearing areas

82. How do resin-modified glass ionomer luting cements differ from conventional glass ionomer luting cements?
(A) Conventional cements release more fluoride
(B) Resin-modified versions set purely by acid-base reaction
(C) Resin-modified versions require a photo-initiated or dual cure
(D) Conventional cements cannot bond chemically to dentin

83. A dentist cements a porcelain inlay with minimal retentive form. Which procedure best ensures a durable bond?
(A) Use of zinc phosphate without surface treatment
(B) Application of silane to porcelain and resin cement
(C) Use of a glass ionomer with no bonding agent
(D) Omission of etching

84. A dentist must cement a cast metal post and core in a root canal–treated tooth with minimal coronal structure. Which cement property is most critical?
(A) Slow setting to adjust occlusion
(B) Low film thickness for intimate fit
(C) Excessive solubility for easy removal
(D) High translucency

85. Which incorrect handling step might weaken zinc phosphate cement during mixing?
(A) Using a cooled glass slab
(B) Adding powder incrementally into the liquid
(C) Rapidly blending all powder at once, generating heat
(D) Spreading the mix over a wide area to dissipate heat

86. What is the likely outcome if resin cement is not properly light-cured and the dual-cure mechanism is insufficient?
(A) Enhanced bond strength
(B) Complete polymerization in deep areas
(C) Lower degree of conversion leading to weaker cement
(D) Faster set time than expected

87. Which is the primary effect of moisture contamination on resin-modified glass ionomer during placement?
(A) Enhanced adhesion to tooth
(B) Porous matrix and reduced strength
(C) Prolonged working time without compromise
(D) High compressive strength

88. A 59-year-old patient with bruxism presents for crown cementation. The dentist opts for a high-strength cement less prone to dissolution. Additionally, heavy occlusal forces are anticipated. Which cement is most likely selected?
(A) Conventional glass ionomer
(B) Zinc oxide eugenol
(C) Resin cement
(D) Zinc phosphate

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89. A dentist notices frequent microleakage around crowns cemented with a particular luting material. Which type of cement is most suspect, given its lack of chemical adhesion?
(A) Resin-modified glass ionomer
(B) Polycarboxylate
(C) Zinc phosphate
(D) Adhesive resin

90. A ceramic veneer preparation has minimal enamel. Which cement choice and procedure improve retention?
(A) Conventional glass ionomer with no etch
(B) Zinc oxide eugenol and immediate veneer placement
(C) Total-etch with resin cement and silanation of the veneer
(D) Zinc phosphate cement with no adhesive

91. Which protocol step is crucial for achieving maximum strength with resin cements when luting an indirect composite inlay?
(A) Pouring a gypsum model overnight
(B) Cleansing the inlay with pumice
(C) Etching the internal inlay surface and applying a coupling agent
(D) Cooling the cement in a refrigerator

92. A patient returns a year post-cementation of a crown with localized gingival inflammation around the margin. Which red-flag finding might indicate the cement is breaking down?
(A) Gingival margins look healthy but reddened papillae
(B) Radiographic evidence of washout or gap beneath the crown margin
(C) Margins well-sealed with no shadowing
(D) Sensitivity absent on percussion

93. Which key clinical sign often suggests microleakage under a crown luted with a water-based cement?
(A) Crown mobility within a week of placement
(B) Brownish discoloration at the crown margin
(C) Frank fracture of the crown
(D) Immediate severe pain on biting

94. Assertion: Resin cements can be color-matched for use with ceramic veneers.
Reason: Resin cements typically possess advanced filler particles that control exothermic reaction.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

95. A recently placed crown debonds repeatedly. Radiographic analysis reveals adequate tooth preparation. Which management step can improve retention if the crown's internal surface is porcelain?
(A) Sandblasting or etching the internal ceramic surface and using resin cement
(B) Increasing occlusal vertical dimension artificially
(C) Switching to zinc oxide eugenol cement
(D) Leaving the porcelain unconditioned

96. Which laboratory test best predicts the long-term retention potential of a luting cement under functional load?
(A) Film thickness measurement
(B) Compressive strength test
(C) Microtensile bond strength test
(D) Solubility in water

97. A dentist cements an E-max (lithium disilicate) crown with minimal occlusal clearance. Which critical step ensures maximum bond strength?
(A) Phosphoric acid etch of ceramic
(B) Silane application after hydrofluoric acid etch
(C) Use of zinc phosphate
(D) No internal surface treatment

98. A temporary crown cemented with zinc oxide eugenol repeatedly dislodges. The dentist decides to use a stronger temporary cement yet wants to avoid hindering final resin cement bonding later. Which cement is recommended?
(A) Non-eugenol zinc oxide
(B) Polycarboxylate
(C) Glass ionomer
(D) Resin-modified glass ionomer

99. A 45-year-old patient with bruxism requires a 3-unit fixed bridge. During try-in, minimal retention of the abutment preparation is noted. Which cement choice aids retention and resists occlusal forces?
(A) Zinc phosphate
(B) Polycarboxylate
(C) Adhesive resin cement
(D) Conventional glass ionomer

100. A 50-year-old patient with multiple porcelain crowns returns complaining of a loose crown on a molar. Examination reveals minimal ferrule and short clinical crown height. The dentist decides to extend the crown length surgically but wants a highly retentive cement for final seating. Despite having used glass ionomer previously, the restoration dislodged. The new crown will be zirconia-based. Which cement is most appropriate for maximum retention and improved long-term stability?
(A) Conventional glass ionomer
(B) Zinc oxide eugenol
(C) Resin-modified glass ionomer
(D) Self-adhesive resin cement

101. Which term describes a metal that contains precious elements such as gold, platinum, or palladium in sufficient quantity to resist corrosion in the oral environment?
(A) Base metal
(B) Noble metal
(C) Reactive metal
(D) Allotropic metal

102. Which element in a high-gold alloy typically imparts a grain-refining effect and improves mechanical properties?
(A) Iron
(B) Copper
(C) Ruthenium
(D) Zinc

103. Why is passivation an important phenomenon for base metal alloys used in dentistry?
(A) It lowers the melting range, making casting easier
(B) It produces a protective oxide layer that resists corrosion
(C) It increases the coefficient of thermal expansion
(D) It creates a glossy surface that needs no polishing

104. All the following characteristics are typical of cobalt-chromium partial denture frameworks except:
(A) High strength
(B) Lightweight structure
(C) Low melting temperature
(D) Corrosion resistance due to chromium oxide layer

105. How does a high noble alloy differ from a predominantly base metal alloy when used for fixed prostheses?
(A) High noble alloys are more susceptible to corrosion
(B) Predominantly base metal alloys contain over 25% gold
(C) High noble alloys generally have better biocompatibility and tarnish resistance
(D) Base metal alloys are typically lower in yield strength

106. When fabricating a full gold crown for a patient with a history of metal sensitivities, which factor is most critical in alloy selection?
(A) High copper content to reduce cost
(B) Avoiding nickel and beryllium

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(C) Selecting a type IV gold alloy with minimal noble content
(D) Using a solder with lead for easier repair

107. A clinician needs a clasp for a removable partial denture that is flexible yet strong. Which alloy property is most important?
(A) High modulus of elasticity
(B) Low yield strength
(C) High ductility and springiness
(D) Minimal passivation

108. Which key element in stainless steel instruments creates a protective oxide layer that resists rusting?
(A) Nickel
(B) Zinc
(C) Chromium
(D) Carbon

109. Which handling error might compromise the properties of cobalt-chromium during casting for a removable partial denture framework?
(A) Using a high-heat investment
(B) Allowing the alloy to overheat extensively
(C) Following manufacturer's recommended temperature
(D) Cooling in a controlled manner

110. What is the likely outcome if a high-nickel alloy substructure is placed adjacent to gold restorations in a highly acidic oral environment?
(A) No galvanic activity
(B) Accelerated corrosion of the nickel alloy
(C) Complete passivation of the nickel alloy
(D) Stronger bond between gold and nickel

111. Which primary effect does adding copper to gold alloys achieve?
(A) Decreases tarnish and increases ductility
(B) Raises melting point and reduces elongation
(C) Increases hardness and strength
(D) Produces a white gold color

112. A 50-year-old patient with repeated nickel-related dermatitis requires a full-metal crown. Which option is safer?
(A) Nickel-chromium alloy
(B) High-gold noble alloy
(C) Titanium alloy with nickel
(D) Cobalt-nickel base

113. A 61-year-old with a posterior three-unit bridge complains about a metallic taste. Examination reveals a gold onlay contacting a base metal crown opposing it. Saliva pH is slightly acidic. Which phenomenon likely explains the metallic taste?
(A) Passivation
(B) Coefficient of expansion mismatch
(C) Galvanic corrosion
(D) Tarnish

114. A dentist notices a metal-ceramic crown with a blackish discoloration at the metal-porcelain interface. Which alloy component might most likely cause this defect?
(A) High palladium content
(B) Nickel releasing oxides
(C) Ruthenium for grain refinement
(D) Cobalt for passivation

115. A dentist must replace multiple failing metal crowns in a nickel-allergic patient. Which management choice ensures minimal reaction risk?
(A) Reuse existing base metal crowns if well-adapted
(B) Switch to a nickel-chromium partial coverage onlay
(C) Select a palladium-silver alloy for the new crowns
(D) Use a high noble gold alloy verified nickel-free

116. According to standard guidelines, which step is essential when investing and casting titanium for implant components?
(A) Using gypsum-bonded investment to trap oxygen
(B) Casting in ambient atmosphere

(C) Investing under vacuum or inert gas
(D) Curing the investment at low temperatures

117. A patient with a well-fitting cobalt-chromium partial denture develops inflamed oral tissues beneath the framework. Which red-flag sign might suggest an alloy hypersensitivity rather than simple poor hygiene?
(A) Diffuse plaque accumulation around clasp areas
(B) Localized bright red inflamed tissue precisely matching metal contact
(C) Some generalized mucosal redness across the arch
(D) Halitosis with calculus formation on denture

118. Which symptom commonly indicates galvanic shock from opposing metal restorations?
(A) Chronic dull ache
(B) Tingling or electric sensation upon biting
(C) Delayed throbbing at night
(D) Radiating pain to the ear

119. Assertion: Wrought stainless steel is often used for orthodontic wires.
Reason: Wrought alloys retain high ductility and work-hardening capabilities during wire bending and activation.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

120. A cast gold onlay has slight overextension at the margin. Which adjustment strategy is recommended?
(A) Use a diamond bur at high speed with water spray
(B) Hammer the gold with a mallet to burnish it
(C) Remove the onlay and re-cast the entire restoration
(D) No adjustment is possible for gold onlays

121. Which dental ceramic primarily consists of a glass matrix with a leucite or lithium disilicate crystalline phase to improve strength?
(A) Zirconia
(B) Glass-ceramic
(C) Porcelain-fused-to-metal (opaque layer)
(D) Feldspathic porcelain without crystals

122. Which material is often called the "core ceramic" due to its high flexural strength and opacity, frequently used as a substructure for layered porcelain?
(A) Zirconia
(B) Leucite glass-ceramic
(C) Lithium disilicate
(D) Alumina

123. Why is transformation toughening significant in zirconia restorations?
(A) It increases translucency for better esthetics
(B) It leads to brittleness under masticatory forces
(C) It involves a phase change that arrests crack propagation
(D) It renders zirconia chemically soluble in saliva

124. All of the following are advantages of lithium disilicate ceramics except:
(A) Good translucency for esthetics
(B) Excellent bonding potential with resin cements
(C) Superior fracture toughness compared to zirconia
(D) Ability to be pressed or milled

125. How does feldspathic porcelain generally compare to leucite-reinforced porcelain for anterior veneers?
(A) Feldspathic porcelain always has higher fracture resistance
(B) Leucite-reinforced porcelain offers greater strength than purely feldspathic porcelain
(C) Both materials are equally strong in posterior crowns
(D) Feldspathic porcelain lacks any glass phase

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126. A patient desires all-ceramic crowns for front teeth with a translucent, highly esthetic outcome. Which ceramic is generally the best choice?
(A) Zirconia monolithic
(B) Feldspathic porcelain
(C) Lithium disilicate
(D) Metal-ceramic

127. Which step is crucial when bonding a lithium disilicate crown with resin cement?
(A) Air abrasion of the crown with coarse alumina
(B) Etching with hydrofluoric acid and applying silane
(C) Heating the crown to 250°C prior to cementation
(D) Omitting the adhesive on tooth structure

128. Which key action helps reduce chipping in zirconia restorations layered with veneering porcelain?
(A) Excessively rapid firing cycles
(B) Controlling coefficient of thermal expansion mismatch
(C) Removing the supporting zirconia core thickness
(D) Using no support pins during porcelain build-up

129. Which laboratory error would most likely weaken a porcelain-fused-to-metal crown?
(A) Using an alloy with compatible thermal expansion
(B) Slow cooling the restoration after firing
(C) Abrupt quenching of the fired restoration in water
(D) Applying a controlled oxide layer on the metal surface

130. What is a common consequence if a technician over-fires porcelain during final glaze cycles?
(A) Improved fracture resistance
(B) Decreased surface gloss
(C) Excessive shrinkage and possible color shift
(D) Reduced leucite crystal content

131. Why do traditional feldspathic porcelains tend to show low fracture toughness?
(A) They have large amounts of robust crystalline fillers
(B) Their purely glassy matrix easily propagates cracks
(C) They are only used on posterior teeth
(D) They contain high levels of zirconia grains

132. Which term describes the partial sintering and infiltration of glass into a porous ceramic substructure?
(A) CAD/CAM milling
(B) Slip casting
(C) Pressing
(D) Lost wax technique

133. Why do monolithic zirconia restorations often require occlusal adjustments with special burs?
(A) Zirconia is extremely soft and can be trimmed with standard burs
(B) Conventional diamond burs rapidly overheat zirconia
(C) Zirconia's high hardness demands diamond or zirconia-specific grinders
(D) They are polished using rubber cups alone

134. All the following are reasons for porcelain veneer debonding except:
(A) Inadequate enamel surface etching
(B) Failure to apply silane on veneer's internal surface
(C) Proper use of resin cement with total-etch technique
(D) Contamination by saliva prior to bonding

135. How does a pressable ceramic (e.g., pressed lithium disilicate) differ from a milled CAD/CAM block of the same composition?
(A) Pressable ceramic generally has fewer potential internal flaws
(B) Milled blocks have lower crystallinity
(C) Pressable ceramics are fired at much lower temperatures
(D) Milled blocks cannot achieve full contour restorations

136. For a conservative onlay in a high-stress posterior area, which all-ceramic material provides a combination of strength and the ability to bond?
(A) Feldspathic porcelain
(B) Zirconia monolithic
(C) Lithium disilicate (pressed or milled)
(D) Pure alumina core

137. A patient with moderate bruxism wants a tooth-colored full crown on a molar. Which ceramic approach is recommended?
(A) Thin feldspathic veneer crown
(B) Monolithic zirconia crown with occlusal thickness at least 1.0 mm
(C) Glass ionomer crown
(D) Pressed leucite-reinforced crown at 0.5 mm thickness

138. Which key action is essential when adjusting occlusion on a ceramic restoration to prevent surface microcracks?
(A) Dry grinding with maximum pressure
(B) Intermittent water spray cooling
(C) Using coarse diamond burs without water
(D) Hammer taps for fine adjustment

139. Which laboratory procedure would most compromise the translucency of a ceramic veneer?
(A) Using correct firing temperatures
(B) Applying a vacuum during firing
(C) Over-thick application of opaque layers
(D) Controlling rate of cooling

140. A 38-year-old patient fractures a feldspathic porcelain veneer on a maxillary central incisor. Examination shows minimal remaining veneer structure. Which approach is most appropriate for strength and esthetics?
(A) Bonding a direct composite
(B) Using a zirconia crown
(C) Replacing with pressed lithium disilicate veneer
(D) Placing an amalgam buildup

141. A 44-year-old patient requests an esthetic full-coverage restoration on a premolar with moderate occlusal forces. The current composite is failing, and significant tooth structure is lost. Radiographs show no periapical pathology. The dentist debates porcelain-fused-to-metal versus an all-ceramic. The patient prefers metal-free. Which all-ceramic system balances strength and a lifelike appearance for premolar regions?
(A) Monolithic zirconia with no layered porcelain
(B) Lithium disilicate crown
(C) Pure feldspathic porcelain layered over metal
(D) Polycarbonate crown form

142. Assertion: CAD/CAM milled zirconia restorations are increasingly popular for posterior crowns.
Reason: Zirconia offers high translucency and chemical solubility in saliva.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

143. A feldspathic porcelain crown shows a small cervical chip exposing underlying metal. Which conservative repair strategy can be considered?
(A) Complete crown replacement only
(B) Intraoral composite or porcelain repair kit
(C) Leaving it untreated if metal is not sharp
(D) Using an orthodontic band over the crown

144. Which laboratory test is commonly used to evaluate the flexural strength of ceramic materials?
(A) Three-point bending test
(B) Tensile bond strength test
(C) Vickers hardness test
(D) Thermocycling fatigue test

145. A patient with existing acrylic dentures complains of frequent fractures around the canine area. Which property deficiency likely contributes?
(A) High thermal conductivity
(B) Low impact strength

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(C) Excess resin cross-linking
(D) Excessive polymerization shrinkage

146. A 65-year-old patient's complete dentures have discolored and exhibit crazing lines. The denture base is poly(methyl methacrylate). Which factor most likely caused these changes?
(A) Proper monomer-polymer ratio
(B) Heat processing under controlled conditions
(C) Continuous immersion in hot water
(D) Reinforcement with fibers

147. A 70-year-old with poor ridge support complains of repeated denture fractures in the midline. Examination shows a thin acrylic base and high occlusal forces. Which solution is most viable?
(A) Convert to a flexible nylon denture
(B) Use autopolymerizing repair resin
(C) Reinforce the acrylic with a metal framework
(D) Thicker flanges only

148. A 62-year-old patient with a high esthetic demand requests a removable partial denture. Examination reveals minimal remaining teeth and compromised support. The dentist discusses a metal-framework RPD, but the patient prefers a metal-free, tissue-colored alternative. However, the patient exerts significant bite force. Which material is most suitable to balance aesthetics with adequate rigidity and longevity?
(A) Traditional PMMA with no reinforcement
(B) Polyamide (flexible nylon) denture
(C) Injection-molded PMMA with glass fiber reinforcement
(D) All-ceramic partial framework

149. Assertion: Cross-linked acrylic denture teeth resist wear better than conventional acrylic teeth.
Reason: Cross-linking decreases solubility of the polymer and enhances its mechanical properties.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

150. A dentist notices micro-porosity in a newly processed acrylic denture base. Which management step is recommended to prevent recurrence?
(A) Increase the curing temperature abruptly
(B) Ensure a consistent polymer-to-monomer ratio
(C) Skip the final curing cycle
(D) Use unbalanced compression molding

151. What is the primary purpose of an inlay wax used in dentistry?
(A) Creating long-term temporary restorations
(B) Recording bite registrations
(C) Fabricating the wax pattern for cast restorations
(D) Sealing crown margins intraorally

152. Which wax is commonly applied to adapt over orthodontic brackets or wires to prevent irritation?
(A) Boxing wax
(B) Utility wax
(C) Baseplate wax
(D) Orthodontic relief wax

153. Why is the coefficient of thermal expansion (CTE) particularly important in dental waxes?
(A) Waxes dissolve in saliva if CTE is high
(B) Waxes need high rigidity in the oral cavity
(C) Waxes change dimension significantly with temperature changes
(D) Waxes require minimal elasticity

154. All of the following are uses of baseplate wax except:
(A) Establishing occlusal rims for denture records
(B) Fabricating bite blocks
(C) Forming an immediate final impression directly in the mouth
(D) Holding artificial teeth during trial arrangements

155. How does pattern wax (e.g., inlay wax) differ from processing waxes (e.g., boxing wax) in dentistry?
(A) Pattern waxes have high residual ash upon burnout
(B) Processing waxes are used to create definitive restorations
(C) Pattern waxes require precise flow and minimal residue
(D) Processing waxes have minimal thermal expansion

156. A dentist is fabricating a wax pattern for a complex gold inlay. Which property must the inlay wax exhibit?
(A) Retains high strength at oral temperature
(B) Leaves significant ash residue to improve casting
(C) Maintains dimensional stability once cooled
(D) Contracts heavily on solidification to ensure a tight fit

157. A lab technician wants to prevent air bubbles in stone casts when pouring an impression. Which wax is used to box the impression's borders and control stone flow?
(A) Inlay wax
(B) Boxing wax
(C) Sticky wax
(D) Utility wax

158. Which key action is necessary when using sticky wax to repair a broken acrylic appliance temporarily?
(A) Apply it at room temperature directly
(B) Heat the wax to ensure it flows and bonds
(C) Immerse the wax in water for final hardening
(D) Light cure the wax after placement

159. A student is using baseplate wax to fabricate an occlusal rim. Which incorrect step can lead to inadequate retention on the record base?
(A) Softening the wax uniformly in warm water
(B) Excessively thinning the baseplate wax
(C) Adapting the wax at body temperature to the record base
(D) Trimming and contouring the rim to match arch form

160. What is the likely outcome if inlay wax patterns are not stored at a stable temperature before investment?
(A) Improved marginal accuracy
(B) Likely distortion due to thermal expansion or contraction
(C) Faster burnout with no residue
(D) Enhanced bonding to investment

161. Which is the primary effect of adding plasticizers to baseplate wax?
(A) Increasing brittleness
(B) Reducing the flow at mouth temperature
(C) Improving flexibility and workability
(D) Lowering the wax's melting point drastically

162. A dentist uses rope (utility) wax on an impression tray border for a patient with a high gag reflex. Which function is most relevant?
(A) Registering occlusal relationships
(B) Extending tray length
(C) Forming a final wax pattern
(D) Sealing a cast model

163. A patient's removable partial denture clasp is rubbing the cheek. The dentist places sticky wax to position a relief area. Which property of sticky wax is beneficial here?
(A) Quick adhesion upon cooling
(B) Slow hardening with minimal stiffness
(C) Low melting point with permanent tackiness
(D) Residue-free removal at high temperature

164. A 55-year-old patient's custom tray requires a minor extension in the buccal area. The dentist uses utility wax to build the tray border. Which advantage does utility wax provide?
(A) Extremely rigid addition
(B) Safe bonding at high temperatures
(C) Soft pliable manipulation at room temperature
(D) Low coefficient of thermal expansion

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165. A 60-year-old edentulous patient requires new complete dentures. The dentist constructs record bases using autopolymerizing acrylic. For occlusal rims, the dentist applies baseplate wax. During the try-in appointment, the wax rims become distorted in the warm operatory. Which characteristic of baseplate wax likely contributed?
(A) Inability to bond to the record base
(B) Low flow at body temperature
(C) High thermal conductivity
(D) Increased flow near mouth temperature

166. What is the primary role of a bite registration wax?
(A) Replacing missing tooth structure permanently
(B) Capturing interocclusal relationships
(C) Bonding brackets in orthodontics
(D) Sealing peripheries of an impression

167. Which dental wax is uniquely formulated to become highly brittle upon cooling, making it ideal for assembling metallic or resin parts temporarily?
(A) Utility wax
(B) Sticky wax
(C) Boxing wax
(D) White orthodontic wax

168. Why is wax burnout behavior (during casting) significant in dentistry?
(A) It creates chemical adhesion to the investment
(B) It determines if the final metal casting will be porous
(C) It indicates solubility in monomers
(D) It stops wax from adapting to fine margins

169. All of the following are advantages of using utility wax for border molding except:
(A) Easy manipulation at room temperature
(B) Immediate rigid set upon placement
(C) Non-irritating to soft tissues
(D) Can be trimmed with minimal heat

170. How do corrective impression waxes differ from inlay waxes?
(A) Corrective waxes leave minimal residue upon burnout
(B) Inlay waxes are used intraorally to capture tissue details
(C) Corrective waxes flow in thin layers to record tissue details
(D) Inlay waxes have no effect on final cast accuracy

171. A clinician needs to record functional border movements in a denture impression. Which wax is suitable for dynamic tissue molding?
(A) Inlay wax
(B) Baseplate wax
(C) Impression compound
(D) Border molding wax (stick modeling wax)

172. A dentist desires to reduce the flow of baseplate wax during the try-in stage. Which method can help?
(A) Use a flame to heat the wax until it drips
(B) Work in a cool environment or refrigerate the wax
(C) Add eugenol to the wax
(D) Select a wax with a lower melting range

173. When adapting sheet wax for a matrix of a provisional restoration, which key feature ensures easy removal without distorting the provisional?
(A) Extremely high melting point
(B) Moderate elasticity upon cooling
(C) Sticky surface to retain shape
(D) Zero coefficient of thermal expansion

174. A technician is investing a wax pattern. Which step, if performed incorrectly, might cause incomplete burnout and casting defects?
(A) Keeping the wax pattern in a controlled environment
(B) Using the correct burnout temperature and duration
(C) Placing the ring in the burnout furnace at the correct time

(D) Removing the wax pattern from the ring just before investing

175. If utility wax is used heavily on the tray edges and not adapted properly, what is the likely clinical outcome?
(A) Perfectly extended tray with no distortions
(B) Overextension leading to inaccurate vestibular recording
(C) Strengthened tray with minimal polymerization shrinkage
(D) Zero chance of gag reflex

176. Which is the primary effect of a higher softening range in baseplate wax?
(A) It distorts readily at oral temperature
(B) It remains stable for a longer period in the mouth
(C) It flows excessively upon slight heating
(D) It cannot be used to build occlusal rims

177. A 45-year-old patient with deep caries needs an onlay. The dentist fabricates a wax pattern on the prepared tooth. Upon removal, the pattern distorts. Which property of inlay wax did not perform adequately?
(A) Low flow at mouth temperature
(B) High tensile strength
(C) High coefficient of thermal expansion
(D) Complete burnout

178. A newly fabricated wax pattern consistently shows open margins when cast in metal. Examination reveals no issues with the metal or investment. Which wax-related cause is most probable?
(A) Low residual ash
(B) Excessive thermal stability
(C) Wax was carved at room temperature after cooling
(D) Delayed investment, causing the pattern to distort

179. A dentist notes minor voids in the stone cast. Investigation reveals poor "boxing" of the impression. Which management decision improves the cast pour?
(A) Use inlay wax to confine the stone
(B) Apply boxing wax around the tray edges
(C) Replace the impression material with a different brand
(D) Add sticky wax inside the negative spaces

180. Which step is recommended by standard guidelines when handling wax patterns before casting?
(A) Spraying with disinfectant and storing for days
(B) Quick rinsing in warm water to remove debris, then investing promptly
(C) Heating the pattern to near-melting to reduce contamination
(D) Always placing the pattern in a freezer overnight

181. A lab technician sees repeated incomplete castings after burnout. Which red-flag symptom might point to wax residue in the mold?
(A) Black discoloration or soot inside the investment
(B) Perfectly smooth internal surfaces of the casting
(C) Short burn cycle preventing oxide formation
(D) Residual monomer from acrylic patterns

182. Which symptom might indicate the wax used for a provisional matrix is softening too quickly intraorally?
(A) Patient reports an odd taste
(B) Matrix distorts upon removal
(C) Matrix shows perfect adaptation
(D) Hard, rigid matrix at mouth temperature

183. Assertion: Boxing wax extends the height of an impression for an adequate base.
Reason: Boxing wax has high flow at mouth temperature, enabling interocclusal records.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.

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(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

184. A cast gold restoration is binding on the proximal contact. The wax pattern might have been too tight. Which management step during wax-up helps prevent tight contacts?
(A) Applying utility wax to proximal surfaces
(B) Leaving a slight spacer or relief near the contact
(C) Heating the wax pattern to soften it inside the contact area
(D) Immediately investing at a high temperature

185. Which lab test can detect if a wax exhibits too high residual ash upon heating?
(A) Bond strength test
(B) Casting microstructure analysis
(C) Thermogravimetric analysis (TGA)
(D) Three-point bend test

186. A dentist adjusts an occlusal rim and notices the wax smears easily under finger pressure. Which wax property is causing difficulty?
(A) High melting range
(B) Low flow at mouth temperature
(C) Low glass transition temperature
(D) Brittleness at body temperature

187. A patient has a high palatal vault. During impression tray selection, the dentist places rope wax along the tray's palate area. Which benefit does this provide?
(A) Creates final cast margins
(B) Adds rigid base for bite registration
(C) Prevents tray overextension by cutting edges
(D) Improves adaptation to the deep vault

188. A 48-year-old requires a wax-up to visualize anterior esthetics before veneer preparation. The dentist plans to show the patient a trial smile. Which wax property is essential for shaping these additive contours?
(A) Quick burnout
(B) Translucency at mouth temperature
(C) Good carving ability and moderate flow
(D) Structural support at 100°C

189. A 60-year-old edentulous patient has an undercut in the residual ridge. The dentist modifies the custom tray with wax to accommodate this bony prominence. Upon border molding, the wax collapses. Which characteristic is lacking?
(A) Rigid set at mouth temperature
(B) High brittleness on cooling
(C) Sticky adherence upon slight heating
(D) Color stability

190. Assertion: Inlay wax patterns must be free from internal stresses.
Reason: Residual stresses can lead to distortion after the pattern is removed from the tooth or die.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

191. When preparing a double pour of a final impression, a dentist uses boxing wax. Which managerial tip ensures an even cast base?
(A) Heat the wax until it is fluid and pour in stone
(B) Press boxing wax flush to the impression borders
(C) Add sticky wax on the impression surface
(D) Skip the base layer of stone entirely

192. According to standard protocols, which action best prevents distortion of wax patterns when transferring them from the die to the casting ring?
(A) Rapidly chill the pattern in ice water
(B) Store the pattern under a heat lamp

(C) Minimize handling and invest promptly
(D) Add sticky wax on all external surfaces

193. A completed RPD framework does not seat properly, and the lab suspects the refractory cast was distorted. Which red-flag sign in the wax-up stage might have predicted distortion?
(A) Wax-up completed in a single short session
(B) Use of minimal wax for clasp patterns
(C) Excess heating of pattern wax on the refractory cast
(D) Quick cooling in ambient air

194. Which sign typically indicates that a wax pattern's margins have distorted before investment?
(A) Visible gap at the cavosurface margin under magnification
(B) Enhanced smoothness along the axial walls
(C) Tightly adapted internal surface
(D) No discrepancy upon die inspection

195. Assertion: Pattern waxes should have minimal thermal expansion at working temperatures.
Reason: Excessive expansion ensures better fit of the casting on the tooth preparation.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

196. A gold onlay casting repeatedly shows short margins. The dentist suspects wax pattern distortion from variable temperatures. Which management strategy is best?
(A) Flame-heat the wax pattern to seal margins
(B) Store the pattern in a freezer for stability
(C) Maintain a controlled room temperature and invest immediately
(D) Carve the wax pattern in segments over multiple days

197. If repeated castings show small nodules or blebs, which wax-related test might diagnose contamination with moisture or oils?
(A) Colorimetric pH analysis
(B) X-ray fluorescence
(C) Contact angle measurement on wax surface
(D) Particle size distribution

198. During a try-in for a wax denture setup, the dentist observes wax flaking on the occlusal surfaces. Which characteristic may be lacking?
(A) Adequate toughness
(B) High thermal expansion
(C) Translucency
(D) Rapid burnout

199. A 70-year-old's denture base has a minor defect near the flange. The dentist decides to patch it with autopolymerizing resin. Sticky wax is used to position the repair piece. Which sticky wax feature aids this repair?
(A) Permanent bond at oral temperature
(B) Rigid set after cooling
(C) High fluidity at low temperature
(D) Slow setting reaction

200. A 58-year-old patient needs a diagnostic wax-up to evaluate potential crown lengthening for an upper incisor. The dentist sculpts the new gingival contours and incisal edges using a modeling wax. However, repeated slight temperature fluctuations in the operatory cause warping of the wax margins. Which property of modeling wax is contributing most to this distortion?
(A) High glass transition temperature
(B) Minimal flow at ambient temperature
(C) Pronounced thermal expansion coefficient
(D) High modulus of elasticity

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CHAPTER 02

ORAL PATHOLOGY

1. Which of the following best describes a cleft palate in developmental terms?
   (A) A congenital anomaly involving incomplete fusion of the alveolar process
   (B) A congenital anomaly involving a midline defect in the soft palate only
   (C) A congenital anomaly resulting from incomplete fusion of the palatal shelves
   (D) A congenital anomaly exclusively affecting the uvula

2. At which gestational age does the palate typically begin to fuse?
   (A) 3rd to 4th week in utero
   (B) 6th to 7th week in utero
   (C) 9th to 10th week in utero
   (D) 12th to 13th week in utero

3. Which embryonic process failure is most directly linked to the etiology of cleft lip?
   (A) Fusion of the lateral palatine processes
   (B) Fusion of the medial nasal and maxillary processes
   (C) Fusion of the frontonasal and mandibular processes
   (D) Fusion of the right and left maxillary processes

4. All of the following are features of Pierre Robin sequence EXCEPT:
   (A) Micrognathia
   (B) Glossoptosis
   (C) U-shaped cleft palate
   (D) Bifid uvula

5. How does macroglossia differ from microglossia in developmental origin?
   (A) Macroglossia arises from underdevelopment of the tongue bud; microglossia from overgrowth of lingual tissue
   (B) Macroglossia is usually associated with endocrine imbalances; microglossia is a separate genetic disorder
   (C) Macroglossia arises from excessive proliferation of tongue tissues; microglossia is linked to incomplete tongue bud development
   (D) Both are unrelated to genetic syndromes

6. In cases of ankyloglossia (tongue-tie), which intervention is most appropriate if the patient presents with significant speech difficulties?
   (A) Orthodontic consultation only
   (B) Immediate frenectomy
   (C) Speech therapy without surgical intervention
   (D) Close observation until skeletal maturity

7. Which developmental disturbance is most likely in a patient who presents with a painless midline swelling in the floor of the mouth, suspected to be a thyroglossal duct anomaly?
   (A) Dermoid cyst
   (B) Thyroglossal cyst
   (C) Branchial cleft cyst
   (D) Cystic hygroma

8. A neonate is born with a large orofacial cleft involving both lip and palate. Which initial intervention is most critical in ensuring the child's well-being?
   (A) Surgical lip repair at birth
   (B) Speech therapy referral
   (C) Immediate feeding support and use of specialized cleft feeding devices
   (D) Genetic testing

9. Which key anatomical landmark is typically affected in a unilateral cleft lip?
(A) Premaxilla
(B) Philtrum
(C) Tubercle of the upper lip
(D) Labial frenum

10. Which of the following statements about developmental disturbances of the tongue is INCORRECT?
(A) Microglossia is often associated with hypoplastic mandible
(B) Macroglossia can cause dental malocclusion
(C) Ankyloglossia always resolves spontaneously
(D) Glossitis is an acquired inflammation rather than a developmental anomaly

11. Which statement best reflects the likelihood of isolated cleft palate compared to cleft lip with or without cleft palate?
(A) Isolated cleft palate is more common than cleft lip
(B) Cleft lip with or without cleft palate is more frequent than isolated cleft palate
(C) Both occur with equal frequency
(D) Neither can occur without an associated syndrome

12. Maternal smoking during pregnancy is most strongly associated with which of the following orofacial developmental disturbances?
(A) Ankyloglossia
(B) Cleft lip and/or cleft palate
(C) Macroglossia
(D) Fordyce's granules

13. A 3-day-old infant presents with feeding difficulty and nasal regurgitation of milk. Examination reveals a gap in the uvula and mid-portion of the palate. What is the likely diagnosis?
(A) Submucous cleft palate
(B) Unilateral cleft lip
(C) Complete cleft palate
(D) Bifid uvula only

14. A 6-year-old child with a repaired cleft lip at 3 months of age now presents for routine dental evaluation. The parent reports the child struggles with certain consonant sounds and frequently has ear infections. On examination, the soft palate does not elevate adequately. Which complication is most likely impacting speech?
(A) Velopharyngeal insufficiency
(B) Tongue thrusting
(C) Recurrent tonsillitis
(D) Adenoid hypertrophy

15. Which age range is typically recommended for surgical repair of a cleft palate to facilitate proper speech development?
(A) 3 to 6 months of age
(B) 6 to 9 months of age
(C) 9 to 18 months of age
(D) After 2 years of age

16. According to standard cleft management protocols, which specialist is NOT routinely part of the multidisciplinary team?
(A) Plastic surgeon
(B) Speech-language pathologist
(C) Pediatrician
(D) Nephrologist

17. Which associated feature should raise suspicion of a syndromic cleft rather than an isolated cleft anomaly?
(A) Family history of cleft lip
(B) Height and weight within normal range
(C) Presence of congenital heart defects
(D) Occasional otitis media

18. A bifid uvula in the absence of other noticeable clefts may indicate a submucous cleft. Which clinical sign is often associated with this hidden anomaly?
(A) Nasal regurgitation during feeding
(B) Macroglossia
(C) Midline mandibular cleft
(D) Crossbite

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19. Assertion: Cleft lip and palate can be detected by prenatal ultrasound.
Reason: High-resolution ultrasonography can visualize facial structures around the mid-trimester.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

20. A 4-year-old child presents with nasal speech and recurrent ear infections. Examination reveals a bluish discoloration at the midline of the soft palate and a bifid uvula. Submucous cleft palate is suspected. What is the recommended intervention?
(A) Palatoplasty
(B) Tonsillectomy
(C) Observation only
(D) Frenectomy

21. Which statement best defines dental caries from a general pathology perspective?
(A) A localized infection caused exclusively by Staphylococcus aureus
(B) A demineralization of tooth structures due to bacterial acid production
(C) A hyperplastic response of pulp tissues
(D) An inflammation of the periodontal ligament

22. Which microorganism is most commonly associated with the initiation of dental caries?
(A) Streptococcus mutans
(B) Lactobacillus acidophilus
(C) Actinomyces israelii
(D) Porphyromonas gingivalis

23. How does saliva help protect against dental caries pathogenesis?
(A) By creating an acidic environment
(B) By providing proteolytic enzymes
(C) By buffering acids and supplying remineralizing ions
(D) By removing the acquired pellicle

24. All of the following factors contribute to dental caries formation EXCEPT:
(A) High sugar intake
(B) Low salivary flow
(C) Fluoride exposure
(D) Acidogenic bacteria

25. Which contrast in caries lesion progression is correct when comparing enamel to dentin?
(A) Enamel lesions progress slower; dentin lesions progress faster due to lower mineral content
(B) Enamel lesions progress faster; dentin lesions progress slower due to higher mineral content
(C) Both enamel and dentin lesions progress at the same speed
(D) Enamel is less mineralized than dentin, so it demineralizes quickly

26. What is the most effective preventive measure against dental caries at a population level?
(A) Routine antibiotic prophylaxis
(B) Community water fluoridation
(C) Annual radiographic screening
(D) High-protein diets

27. Which dietary modification is recommended to reduce the risk of dental caries?
(A) Increase frequent snacking
(B) Replace fermentable carbohydrates with xylitol-based products
(C) Consume sticky candies between meals
(D) Limit water intake after meals

28. A patient shows early enamel demineralization. Which intervention is most appropriate to arrest or reverse the lesion?
(A) Dental amalgam restoration
(B) Extraction of the affected tooth
(C) Topical fluoride application
(D) Placement of a full-coverage crown

29. Which key factor facilitates bacterial adhesion to the tooth surface in the caries process?
(A) High saliva pH
(B) Dental plaque biofilm formation on the acquired pellicle
(C) Excessive mineralization of enamel
(D) Systemic antibiotic use

30. Which statement is INCORRECT regarding the role of fluoride in caries prevention?
(A) Fluoride enhances remineralization by incorporating into the tooth structure
(B) Fluoride reduces enamel solubility in acidic environments
(C) Excess fluoride ingestion can lead to dental fluorosis
(D) Fluoride has no effect on bacterial metabolism

31. Which factor significantly increases the likelihood of root caries in older adults?
(A) High salivary flow rate
(B) Presence of well-contoured gingival margins
(C) Gingival recession exposing cementum
(D) Fluoridated toothpaste use

32. Frequent sugar intake leads to repeated acid attacks on enamel. Which outcome is most directly caused by these acid challenges?
(A) Enamel remineralization
(B) Increased salivary flow
(C) Lowered oral pH
(D) Enhanced bacterial apoptosis

33. A 10-year-old child has multiple white spot lesions on anterior teeth, poor oral hygiene, and high sugar intake. Radiograph reveals incipient interproximal caries. Which prevention measure is vital?
(A) Fissure sealants on posterior teeth
(B) Topical fluoride application
(C) High dose antibiotics
(D) Orthognathic surgery

34. A 45-year-old patient presents with rampant caries in the cervical areas of multiple teeth. The patient has a history of radiation therapy to the head and neck. Clinical exam shows atrophic salivary glands, and the patient complains of persistent dry mouth. Which factor most likely contributed to rapid caries progression?
(A) Sialolithiasis
(B) Radiation caries due to reduced salivary flow
(C) Gingivitis
(D) High fluoride exposure

35. In a high-risk caries patient, what is the recommended frequency of professional fluoride varnish applications?
(A) Once every 12 months
(B) Every 3 to 6 months
(C) Only when cavitation is evident
(D) Every 2 years

36. According to WHO guidelines, reducing free sugar intake below which percentage of total energy can significantly lower caries risk?
(A) 25%
(B) 15%
(C) 10%
(D) 5%

37. Which finding might suggest a systemic etiology of dental caries rather than purely local factors?
(A) Caries limited to a single tooth
(B) Caries prevalent in all first molars with enamel defects
(C) Higher decayed surfaces in posterior teeth only
(D) Caries in adults with consistent daily brushing

38. Which clinical sign on enamel strongly suggests an active, non-cavitated carious lesion?
(A) Brown discoloration that is hard upon probing
(B) An opaque, whitish spot lesion that feels rough when the tooth is dry
(C) A smooth, polished surface near the gingiva
(D) A black-stained pit in the occlusal region

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39. Assertion: Dental sealants reduce the incidence of occlusal caries in permanent molars.
Reason: Sealants prevent bacteria from colonizing the fissures.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

40. A 17-year-old with a high-sugar diet presents with mild enamel lesions confined to the outer half of dentin on radiographs. The dentist proposes minimal intervention dentistry. Which approach is most appropriate?
(A) Full coverage crown
(B) Operative restoration with prophylactic pulpotomy
(C) Remineralization therapy and monitoring
(D) Extraction

41. Which condition is defined by the gradual loss of tooth structure at cervical areas unrelated to caries?
(A) Attrition
(B) Abrasion
(C) Erosion
(D) Abfraction

42. Which of the following most commonly leads to pulp necrosis?
(A) Hyperemia in the pulp
(B) Chronic mild gingivitis
(C) Untreated deep carious lesion
(D) Routine scaling

43. How does periapical abscess differ from a periapical granuloma in their pathological nature?
(A) Both are purely inflammatory with no microorganisms
(B) An abscess is an acute collection of pus; a granuloma is a chronic inflammatory lesion
(C) A granuloma forms only in non-vital teeth; an abscess forms in vital teeth
(D) Both are associated with reversible pulpitis

44. All of the following are features of acute apical periodontitis EXCEPT:
(A) Tenderness to percussion
(B) Spontaneous throbbing pain
(C) Diffuse radiolucency around the apex
(D) Possible extension to acute alveolar abscess

45. Which statement correctly contrasts a radicular cyst with a periapical abscess?
(A) Both are vital pulp lesions
(B) A radicular cyst contains a true epithelial lining; an abscess does not
(C) Abscesses have no bacteria; cysts are filled with pathogens
(D) Neither is related to pulp necrosis

46. Which management is most appropriate for an acute periapical abscess in a necrotic tooth?
(A) Antibiotics alone, without drainage
(B) Immediate extraction without endodontic consultation
(C) Access opening, drainage, and root canal treatment
(D) Placement of a permanent filling over the cavity

47. In a patient with chronic periodontitis, which primary process leads to alveolar bone loss around the teeth?
(A) Excessive fluoride intake
(B) Bacterial plaque-induced inflammation
(C) Systemic allergies
(D) Enamel hypoplasia

48. Which clinical feature distinguishes an acute periodontal abscess from a periapical abscess?
(A) Vital pulp response in the affected tooth
(B) Presence of severe carious lesion
(C) Radiographic periapical radiolucency
(D) Absence of gingival inflammation

49. What is the primary goal in the treatment of chronic periodontitis?
(A) Teeth extraction
(B) Complete eradication of all oral bacteria

(C) Reduction of periodontal pockets and control of inflammatory processes
(D) Root canal treatment of all posterior teeth

50. Which diagnostic tool is most commonly used to evaluate periodontal bone loss around teeth?
(A) Cone-beam computed tomography (CBCT) for all cases
(B) Panoramic radiograph and periapical radiographs
(C) MRI of the jaws
(D) Ultrasonography of gingiva

51. Which statement best defines aphthous ulcers (canker sores)?
(A) Chronic inflammatory lesions affecting the tonsillar region only
(B) Self-limiting, painful ulcerations of non-keratinized oral mucosa
(C) Bacterial infections limited to the dorsum of the tongue
(D) Autoimmune vesiculobullous lesions primarily on attached gingiva

52. Which salivary gland is most frequently affected by sialolithiasis (salivary stones)?
(A) Sublingual gland
(B) Minor salivary glands of the palate
(C) Parotid gland
(D) Submandibular gland

53. What is the main pathophysiologic feature of recurrent herpes labialis (cold sores)?
(A) Constant viral replication on the gingiva
(B) Reactivation of latent herpes simplex virus in the trigeminal ganglion
(C) Autoimmune destruction of epithelial cells
(D) Antibody-mediated inflammation of minor salivary glands

54. All of the following are clinical variants of lichen planus in the oral cavity EXCEPT:
(A) Reticular form with lace-like Wickham's striae
(B) Erosive form with painful ulcerations
(C) Plaque form mimicking leukoplakia
(D) Necrotizing form with bone exposure

55. How do minor aphthous ulcers differ from major aphthous ulcers?
(A) Minor aphthae heal more slowly and exceed 1 cm in diameter
(B) Minor aphthae are typically larger and leave scars upon healing
(C) Major aphthae exceed 1 cm in diameter and may scar
(D) Both types only appear on the dorsal tongue

56. A patient presents with bilateral white, lace-like lesions on the buccal mucosa, asymptomatic and persistent for months. Which management step is most appropriate?
(A) Immediate surgical excision of all lesions
(B) Watchful waiting and biopsy only if symptoms develop or if appearance changes
(C) High-dose systemic corticosteroids
(D) Antibiotic therapy targeting Streptococcus mutans

57. A 40-year-old patient reports oral burning, especially on spicy foods. Exam shows diffuse, erythematous regions on the dorsum of the tongue, bordered by elevated white outlines that shift location over time. What is the likely diagnosis?
(A) Leukoplakia
(B) Erythroplakia
(C) Geographic tongue
(D) Traumatic ulcer

58. A patient has a suspected mucous retention cyst (mucocele) on the lower lip. Which initial treatment is typically recommended?
(A) Full-thickness wedge resection of the lip
(B) Simple saline rinses only
(C) Surgical excision of the lesion, including the associated minor salivary gland
(D) Systemic corticosteroids

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59. Which key histopathologic feature characterizes pemphigus vulgaris in oral lesions?
(A) Subepithelial blistering with a linear band of IgG
(B) Suprabasilar acantholysis with intraepithelial bullae
(C) Hyperkeratosis of the surface epithelium
(D) Granular IgA deposits at the tips of rete ridges

60. Which statement is INCORRECT regarding Sjögren's syndrome?
(A) It primarily affects exocrine glands, leading to dry mouth and dry eyes
(B) Patients often present with bilateral parotid gland enlargement
(C) It is a malignant neoplasm of the salivary glands
(D) Rheumatoid factor may be positive

61. Which population is more likely to develop mucous membrane pemphigoid?
(A) Young males with no systemic diseases
(B) Postmenopausal women over 50 years old
(C) Children under 10 years old
(D) Immunocompromised adolescents

62. Chronic atrophic candidiasis (denture stomatitis) most directly results from which primary factor?
(A) Vitamin C deficiency
(B) Pathogenic infiltration of the periodontal ligament
(C) Persistent fungal colonization beneath ill-fitting dentures
(D) Viral infection of the buccal mucosa

63. A patient with recurrent bilateral parotid gland swelling, dryness of the mouth, and gritty sensation in eyes undergoes serologic testing. Anti-SSA (anti-Ro) antibodies are detected. Which is the most likely diagnosis?
(A) Sjögren's syndrome
(B) Scleroderma
(C) Sarcoidosis
(D) Primary biliary cirrhosis

64. A 55-year-old female complains of painful oral erosions that bleed on minimal trauma. Examination reveals flaccid bullae on the buccal mucosa. Nikolsky sign is positive. Histopathology shows suprabasilar splits with acantholytic cells. Which immunopathological finding is most characteristic of this condition?
(A) Linear IgG at the basement membrane
(B) Granular IgA deposits in the lamina propria
(C) Intercellular IgG antibodies against desmogleins
(D) IgE-mediated mast cell activation

65. Which management is commonly recommended for erosive oral lichen planus causing chronic pain and ulcerations?
(A) No treatment required, as lesions are always asymptomatic
(B) High-dose antibiotics for 6 weeks
(C) Topical corticosteroids or immunosuppressants
(D) Surgical excision of all ulcerated areas

66. All of the following are reasons for challenging bite mark evidence in court EXCEPT:
(A) Skin distortion can alter the bite pattern
(B) Environmental factors may blur the mark over time
(C) Human teeth always produce perfectly reproducible bite patterns
(D) Experts may disagree on the degree of similarity

67. Which factor most increases the likelihood of obtaining DNA from a bite mark on a victim's clothing?
(A) The bite was inflicted through multiple fabric layers
(B) The scene was exposed to heavy rainfall
(C) The suspect's saliva is deposited on a single thin clothing layer
(D) The clothing was never retrieved for laboratory analysis

68. How does the timing of tooth eruption assist forensic experts in estimating a child's age?
(A) Deciduous teeth erupt randomly at any age
(B) Permanent teeth appear in identical sequences for all populations
(C) Eruption timelines, though culturally modifiable, usually follow a predictable pattern
(D) Tooth eruption does not correlate with chronological age

69. An unconscious victim is found wearing custom-made full dentures labeled with initials. How might the forensic dentist confirm the individual's identity despite the victim being unresponsive?
(A) DNA swabs from the dentures
(B) Direct fingerprint comparison
(C) Matching the labeled dentures with the patient's known dental records
(D) Mandibular bone biopsy

70. A 28-year-old man is arrested after allegedly biting a security guard. The guard's arm shows a distinct arc with separate impressions for each incisor and a unique rectangular outline on the lateral edge. The suspect's upper right lateral incisor is fractured. Which forensic finding would most strongly implicate him?
(A) Multiple superficial scratches
(B) Swab negative for any saliva
(C) Bite mark lacking incisal detail
(D) A corresponding rectangular notch matching the suspect's fractured incisor

71. Which key action ensures accurate bite mark comparison when photographing the wound?
(A) Excluding any measuring scale for a clean image
(B) Using a standardized scale (e.g., ABFO No. 2) placed at skin level
(C) Taking the photo from high above without focusing
(D) Deforming the wound for better lighting

72. Which statement regarding salivary DNA recovery from bite marks is INCORRECT?
(A) Swabbing the site promptly can capture epithelial cells from the biter
(B) Over time, DNA degradation can reduce the sample's viability
(C) Gentle, sterile technique helps avoid cross-contamination
(D) Using bleach on the wound prior to swabbing improves DNA yield

73. Why do old dental radiographs of extracted or root canal–treated teeth enhance forensic identification success?
(A) They are unaffected by morphological changes
(B) They provide unique canal or restoration configurations that remain visible postmortem
(C) They eliminate the need for all other forensic methods
(D) They show alveolar crest patterns only

74. A 60-year-old male homicide victim has advanced dental work, including multiple crowns and implants. The suspect claims the victim's identity is mistaken. How might the forensic dentist refute this claim?
(A) Discard all crowns for lack of relevance
(B) Demonstrate each crown and implant position matches antemortem records
(C) Rely exclusively on partial fingerprint data
(D) Compare footprints of the victim

75. In a disaster zone, how should forensic dentists manage partial maxillary fragments to optimize identification?
(A) Combine them all in one container labeled "maxilla fragments"
(B) Assign separate identifiers to each fragment and record distinctive features or restorations
(C) Clean them with corrosive chemicals for quick analysis
(D) Disregard alveolar bone fragments unless teeth are attached

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76. Which of the following is a benign tumor of the salivary glands composed of both epithelial and myoepithelial components in a fibromyxoid stroma?
(A) Mucoepidermoid carcinoma
(B) Pleomorphic adenoma
(C) Warthin tumor
(D) Adenoid cystic carcinoma

77. Which of the following benign oral tumors arises from stratified squamous epithelium and often presents as a cauliflower-like exophytic lesion?
(A) Papilloma
(B) Lipoma
(C) Hemangioma
(D) Odontoma

78. Which primary histologic feature distinguishes carcinoma in situ from invasive squamous cell carcinoma of the oral cavity?
(A) The presence of abnormal keratin pearls
(B) Invasion through the basement membrane
(C) Dysplastic changes confined to the basal layer only
(D) A uniform population of mature squamous cells

79. All of the following are features associated with squamous cell carcinoma of the tongue EXCEPT:
(A) A painless ulcer or mass
(B) High propensity for local invasion
(C) Rapid metastasis to cervical lymph nodes
(D) Invariably well-differentiated histology

80. How does verrucous carcinoma differ from conventional squamous cell carcinoma (SCC) in the oral cavity?
(A) Verrucous carcinoma has an extremely aggressive course and high metastatic rate
(B) Verrucous carcinoma lacks keratin production
(C) Verrucous carcinoma displays a warty exophytic growth with minimal dysplasia and low metastatic potential
(D) Verrucous carcinoma arises exclusively in minor salivary glands

81. Which is the single most important risk factor for oral squamous cell carcinoma in India and Southeast Asia?
(A) Betel nut (areca) and tobacco chewing
(B) High-fiber diet
(C) Excessive daily brushing
(D) Use of mouthwashes containing fluoride

82. A 60-year-old with a slow-growing, painless swelling in the parotid region is diagnosed with Warthin tumor. Which additional characteristic is commonly found?
(A) Bilateral or multifocal involvement
(B) Rapid ulceration of the overlying skin
(C) Predominance in children
(D) High-grade malignant transformation

83. For a suspected pleomorphic adenoma of the parotid gland, which management is generally recommended?
(A) Incisional biopsy to confirm, then observe
(B) MRI or appropriate imaging followed by superficial parotidectomy
(C) Chemotherapy with cisplatin
(D) Radiation therapy to the gland

84. Which key microscopic feature typifies adenoid cystic carcinoma of salivary glands?
(A) Sheets of clear cells producing mucin
(B) Cribriform or “Swiss cheese” pattern
(C) Psammoma bodies in glandular spaces
(D) Predominantly spindle-shaped tumor cells

85. Which statement about oral fibromas (irritation fibromas) is INCORRECT?
(A) Often arise on buccal mucosa along occlusal line
(B) Represent reactive hyperplasia of fibrous tissue
(C) Typically require wide excision with margins
(D) May be asymptomatic or mildly irritated

86. Which of the following benign tumors carries the highest likelihood of transforming into a malignant lesion if left untreated?
(A) Lipoma
(B) Pleomorphic adenoma
(C) Oral papilloma
(D) Traumatic fibroma

87. Long-standing irritation from ill-fitting dentures may lead to an overgrowth of fibrous tissue called:
(A) Epulis fissuratum
(B) Peripheral ossifying fibroma
(C) Pyogenic granuloma
(D) Papillary hyperplasia

88. A 70-year-old with a long history of smokeless tobacco use presents with a slow-growing exophytic lesion at the buccal sulcus. Biopsy shows a verrucous carcinoma. Which feature typically characterizes this tumor?
(A) Rapid metastasis to lymph nodes
(B) Minimal cytologic atypia with broad pushing rete pegs
(C) Uniform infiltration of minor salivary glands
(D) Marked neurovascular invasion

89. A 52-year-old male smoker complains of a non-healing ulcer on the lateral border of his tongue for two months. Examination reveals a firm lesion with indurated margins. Biopsy confirms squamous cell carcinoma. Imaging shows a 2-cm tumor with ipsilateral lymph node involvement, no distant metastases. Which TNM stage aligns with these findings?
(A) T1 N0 M0
(B) T2 N1 M0
(C) T3 N0 M1
(D) T2 N0 M0

90. Which combined therapy is often indicated for advanced oral squamous cell carcinoma (e.g., T3 or T4 lesions)?
(A) Chemotherapy alone
(B) Radiation alone
(C) Surgical resection plus adjuvant radiation or chemoradiation
(D) Observation with repeat biopsy after 6 months

91. Which cyst arises from remnants of the dental lamina and often exhibits keratinization within its lining?
(A) Nasolabial cyst
(B) Odontogenic keratocyst (OKC)
(C) Globulomaxillary cyst
(D) Thyroglossal duct cyst

92. Which cyst is typically located between the roots of the maxillary lateral incisor and canine, presenting as a well-defined radiolucency on radiographs?
(A) Nasopalatine duct cyst
(B) Lateral periodontal cyst
(C) Globulomaxillary cyst
(D) Dentigerous cyst

93. How does a dentigerous cyst develop?
(A) From the maxillary sinus mucosa
(B) Around the crown of an unerupted or developing tooth
(C) From a supernumerary tooth bud
(D) From the remnants of the thyroglossal tract

94. All of the following are considered odontogenic cysts EXCEPT:
(A) Radicular cyst
(B) Dentigerous cyst
(C) Nasolabial cyst
(D) Odontogenic keratocyst

95. How does a radicular cyst differ from a residual cyst?
(A) A radicular cyst always forms in the tooth-free area of the jaw
(B) A residual cyst is left behind after an extraction, whereas a radicular cyst is at the apex of a non-vital tooth
(C) Both are histologically identical and cannot be distinguished clinically
(D) A residual cyst is developmental, while a radicular cyst is inflammatory

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96. Which management approach is recommended for a large dentigerous cyst around an impacted mandibular third molar causing bony expansion?
(A) Simple observation, as cysts always regress spontaneously
(B) Antibiotics alone
(C) Surgical enucleation of the cyst with removal of the impacted tooth
(D) Radiation therapy to shrink the cyst

97. A panoramic radiograph shows a multilocular radiolucency in the posterior mandible with a thin, scalloped border extending between tooth roots. The patient is asymptomatic. Which cyst is highly suggestive based on these findings?
(A) Traumatic bone cyst (simple bone cyst)
(B) Radicular cyst
(C) Nasopalatine duct cyst
(D) Stafne defect

98. Upon surgical exploration of a suspected traumatic bone cyst, no epithelial lining is identified, only an empty cavity. Which immediate management is generally performed?
(A) Placement of bone graft material and closure
(B) High-dose corticosteroids into the cavity
(C) En bloc resection of the mandible
(D) Chemotherapy

99. Which key characteristic helps identify a nasopalatine duct cyst on an anterior maxillary radiograph?
(A) A radiopaque mass near the canine
(B) A well-defined radiolucency at the midline between and apical to the central incisors
(C) Bilateral multilocular radiolucencies in the premolar region
(D) A large periapical lesion with a non-vital maxillary central incisor

100. Which statement regarding odontogenic keratocysts (OKCs) is INCORRECT?
(A) They may exhibit locally aggressive behavior and recur if not completely removed
(B) They have a characteristic parakeratinized lining
(C) They are never associated with nevoid basal cell carcinoma syndrome
(D) They commonly occur in the posterior mandible

101. Which statement best describes oral leukoplakia from a premalignant standpoint?
(A) A red patch on the oral mucosa that cannot be characterized clinically
(B) A white patch that cannot be rubbed off or attributed to any specific disorder
(C) A benign ulcer of known etiology
(D) A blistering condition with autoantibodies against epithelial cells

102. Which premalignant oral lesion demonstrates the highest rate of malignant transformation?
(A) Leukoplakia
(B) Oral submucous fibrosis
(C) Erythroplakia
(D) Frictional keratosis

103. How does oral submucous fibrosis promote malignant transformation?
(A) By stimulating bacterial overgrowth on the tongue
(B) Through progressive fibrosis leading to tissue hypoxia and genetic alterations
(C) By purely mechanical irritation of the buccal mucosa
(D) By eliminating the oral epithelial layer entirely

104. All of the following are clinical features associated with oral submucous fibrosis EXCEPT:
(A) Burning sensation of the mouth
(B) Progressive limitation in mouth opening
(C) Blanching and stiffening of the oral mucosa
(D) Rapid spontaneous resolution without intervention

105. Which difference most accurately distinguishes erythroplakia from leukoplakia clinically?
(A) Erythroplakia is always benign, whereas leukoplakia always displays dysplasia

(B) Leukoplakia exhibits red velvety mucosal changes, and erythroplakia exhibits white patchy lesions
(C) Erythroplakia appears as a red patch and is more likely to harbor dysplasia or carcinoma
(D) Both lesions appear similar clinically and cannot be distinguished visually

106. In evaluating a suspicious leukoplakic patch, which step is most appropriate for definitive diagnosis?
(A) Empirical antifungal therapy to rule out candidiasis
(B) Complete elimination of all local irritants only
(C) Excisional or incisional biopsy to assess for dysplasia
(D) Observation over 12 months without intervention

107. A 35-year-old heavy betel nut chewer presents with blanching of the buccal mucosa and early trismus. Which intervention is most critical in preventing disease progression?
(A) Monthly prophylactic antibiotics
(B) Immediate full-thickness surgical resection
(C) Complete cessation of areca nut chewing
(D) High-dose antifungal mouth rinse

108. Which key clinical sign should prompt biopsy of a longstanding leukoplakic lesion?
(A) Lesion remains homogeneous white with a smooth surface
(B) Lesion reduces in size after cessation of smoking
(C) Appearance of red or speckled (erythroleukoplakic) areas
(D) Patient has no risk habits or irritants

109. Which statement regarding lichen planus as a premalignant condition is INCORRECT?
(A) Erosive or atrophic forms carry a higher malignant transformation risk
(B) Malignant transformation of lichen planus is universally accepted
(C) Clinical follow-up and biopsy of suspicious areas are recommended
(D) Reticular forms are usually less likely to undergo malignant change

110. Which factor most significantly increases the likelihood of malignant transformation in a patient with oral submucous fibrosis?
(A) Young age at presentation
(B) Absence of pain
(C) Continued areca nut use
(D) Presence of multiple systemic diseases

111. Chronic irritation from sharp tooth edges, if left uncorrected, can contribute to the development of:
(A) Erythroplakia
(B) Frictional keratosis that may mimic leukoplakia
(C) Oral submucous fibrosis
(D) Erythema multiforme

112. A 45-year-old male with a 15-year history of smokeless tobacco presents with mottled white-and-red plaques on the buccal mucosa. Biopsy reveals dysplasia. Which diagnosis best fits these findings?
(A) Erythema multiforme
(B) Speckled leukoplakia (erythroleukoplakia)
(C) Lichen planus
(D) Hyperplastic candidiasis

113. A 50-year-old betel quid user complains of progressive inability to open his mouth fully and burning of the oral mucosa. Examination shows blanching of the cheeks with palpable fibrous bands. Histopathology confirms oral submucous fibrosis without evident malignancy. What is the primary therapeutic focus?
(A) Radical surgical excision
(B) Discontinuation of betel quid and supportive treatments
(C) Long-term antibiotic prophylaxis
(D) Chemotherapy

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114. For a well-defined small leukoplakic lesion with mild dysplasia on biopsy, which management is generally recommended?
(A) Radiation therapy
(B) Complete surgical excision or laser ablation
(C) Watchful waiting with no intervention
(D) Total maxillectomy

115. According to the WHO, which practice is crucial to reduce the incidence of premalignant oral lesions in communities where areca nut is widely used?
(A) Mass antibiotic prophylaxis for all betel chewers
(B) Mandatory monthly oral biopsies
(C) Public health campaigns to eliminate areca nut and tobacco use
(D) Incorporation of mouth guards for daily use

116. A speckled lesion on the lateral tongue with an indurated base in a patient over 45 should raise suspicion for:
(A) Benign frictional keratosis
(B) High-grade dysplasia or carcinoma in situ
(C) Angular cheilitis
(D) Minor aphthous stomatitis

117. Persistent ulceration within a leukoplakic patch often signals:
(A) A benign traumatic lesion
(B) Remission of the patch
(C) Transition to a malignant or severely dysplastic lesion
(D) Fungal superinfection

118. Assertion: Erythroleukoplakia carries a higher risk of malignant transformation than homogeneous leukoplakia.
Reason: The red component often indicates significant epithelial atrophy and vascular prominence.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

119. A middle-aged patient with a 10-year history of smoking and alcohol use presents with a well-demarcated white patch on the floor of the mouth. Biopsy reveals mild dysplasia. What is the recommended course of action?
(A) Observation only
(B) Surgical excision or laser ablation
(C) Radiation therapy
(D) Antibiotic mouthwashes

120. A 55-year-old male with bilateral white reticular lesions on the buccal mucosa also shows an erosive patch in the same region, unresponsive to topical steroids. The patient has used areca nut for 12 years. Which step is most critical to rule out malignancy?
(A) Full blood panel
(B) Incisional biopsy of the erosive area
(C) Stop all steroid therapy
(D) Topical antifungal trial

121. Which statement best defines squamous cell carcinoma (SCC) of the oral cavity?
(A) Malignancy of salivary gland origin characterized by mucin production
(B) Neoplastic proliferation of stratified squamous epithelium with potential for local invasion and metastasis
(C) Benign proliferation of epithelium confined to the superficial layers
(D) A fibro-osseous lesion arising from alveolar bone

122. Which of the following is a well-known etiologic factor for oral SCC?
(A) Chronic iron deficiency anemia without external carcinogens
(B) HPV infection (particularly high-risk strains like HPV-16)
(C) Consumption of only fresh fruits and vegetables
(D) Long-term use of proton pump inhibitors

123. How does tobacco smoke contribute to oral carcinogenesis at the cellular level?
(A) By direct viral transformation of epithelial cells
(B) Through chemical carcinogens that induce DNA mutations
(C) By exclusively causing local thermal burns
(D) Through selective antibiotic resistance

124. All of the following are common sites for oral SCC EXCEPT:
(A) Lateral border of the tongue
(B) Floor of the mouth
(C) Ventral tongue
(D) Mid-dorsum of the tongue

125. Which statement correctly differentiates early oral SCC from advanced oral SCC?
(A) Early SCC is often painful; advanced SCC is usually asymptomatic
(B) Early SCC may present as a small ulcer or erythematous plaque; advanced SCC typically shows extensive invasion, possible bone involvement, and nodal metastases
(C) Early SCC always appears exophytic; advanced SCC is always endophytic
(D) Early SCC arises only in older adults, advanced SCC only in younger individuals

126. In staging oral SCC, which factor is typically the most critical prognostic indicator?
(A) Tumor thickness and nodal involvement
(B) Patient age
(C) Duration of lesion
(D) Presence of candida overgrowth

127. Which immediate management is indicated for a suspicious ulcer on the lateral tongue that has not healed for four weeks?
(A) Empirical antifungal therapy
(B) Viral cultures for HSV
(C) Incisional biopsy for histopathologic diagnosis
(D) Nutritional supplementation

128. A 3-cm SCC lesion on the lateral tongue with ipsilateral lymph node metastasis (N1) but no distant spread is discovered. Which combined treatment approach is usually advised?
(A) Surgery plus adjuvant radiation or chemoradiation
(B) Antibiotics followed by routine observation
(C) Chemotherapy alone
(D) Steroid therapy and local curettage

129. Perineural invasion in oral SCC is a key feature associated with:
(A) Minimal recurrence risk
(B) Enhanced radiation sensitivity
(C) Higher risk of local spread and regional recurrence
(D) Definitive cure with topical therapy

130. Which statement regarding verrucous carcinoma of the oral cavity is INCORRECT?
(A) It is a well-differentiated variant of SCC
(B) It often presents a warty, exophytic growth
(C) It frequently metastasizes early
(D) It may exhibit local tissue invasion

131. Which habit combination most dramatically increases the likelihood of oral SCC?
(A) Occasional sugar intake and mild bruxism
(B) Heavy alcohol use and tobacco smoking
(C) High-fiber diets and vegetarianism
(D) Daily carbonated beverage consumption

132. Chronic exposure to UV light on the vermillion border of the lip can lead to:
(A) Lip SCC (actinic cheilitis transforming into squamous cell carcinoma)
(B) Odontoma formation
(C) Tongue fibroma
(D) Erythema multiforme major

133. A 58-year-old with an ulcerative lesion on the lateral tongue complains of ear pain (referred otalgia). Biopsy reveals SCC. Which pathway explains the ear pain symptom?
(A) Distant metastasis to the ear canal

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(B) Referred pain via cranial nerve IX or X
(C) Direct extension to the middle ear
(D) Sinus infection spread

134. A patient presents with a painless ulcer on the floor of the mouth, 2.5 cm in diameter. Examination reveals a palpable submandibular lymph node. Biopsy confirms SCC. Imaging shows no distant metastasis. Which TNM description best fits this scenario?
(A) T1 N1 M0
(B) T2 N1 M0
(C) T3 N0 M0
(D) T2 N0 M1

135. After successful resection of an oral SCC, a patient has negative margins. However, pathology reveals perineural invasion and multiple nodes positive for metastasis. What adjuvant therapy is typically indicated?
(A) None, since margins are clear
(B) Radiotherapy, with or without concurrent chemotherapy
(C) Antibiotics to prevent local infection
(D) Topical steroid therapy to the resection site

136. Which statement best defines oral candidiasis?
(A) A viral infection characterized by single-stranded RNA
(B) A mycotic infection often caused by Candida albicans in immunocompromised or susceptible individuals
(C) A bacterial infection restricted to the gingival sulcus
(D) A prion disorder causing spongiform changes in the oral epithelium

137. Which oral condition is typically caused by Epstein-Barr virus (EBV) in immunocompromised patients, often presenting as corrugated white plaques on the lateral tongue?
(A) Oral hairy leukoplakia
(B) Herpetic stomatitis
(C) Hairy tongue
(D) Cytomegalovirus ulcer

138. How does primary herpetic gingivostomatitis differ from recurrent herpes labialis?
(A) Primary infection often involves widespread oral lesions; recurrent herpes typically appears on the lip vermillion (cold sore)
(B) Recurrent herpes spreads throughout the oral cavity with intense systemic symptoms
(C) Primary infection is always asymptomatic
(D) Recurrent herpes affects only the palate

139. All of the following are typical clinical forms of oral candidiasis EXCEPT:
(A) Pseudomembranous type (thrush)
(B) Erythematous type
(C) Hyperplastic (chronic) type
(D) Pseudotumoral candidosis presenting as a large malignant mass

140. Which differentiates actinomycosis from acute bacterial infections in the oral cavity?
(A) Actinomycosis is caused by viruses in the soft palate
(B) Actinomycosis typically produces draining sinus tracts with “sulfur granules”
(C) Actinomycosis is highly contagious through casual contact
(D) Actinomycosis never affects bone or soft tissue

141. A patient on prolonged corticosteroid therapy develops thrush with white plaques that wipe off, leaving a red surface. Which treatment is most appropriate?
(A) High-dose antibiotics
(B) Antiviral therapy with acyclovir
(C) Topical antifungal medication (e.g., nystatin or clotrimazole)
(D) Intraoral steroid injection

142. A child develops painful vesicles on the buccal mucosa and tongue, accompanied by mild fever. The lesions rupture to form small ulcers. Herpangina or hand-foot-and-mouth disease are suspected. Which viral family is most commonly involved?
(A) Herpesviruses

(B) Orthomyxoviruses
(C) Paramyxoviruses
(D) Coxsackieviruses (Picornaviridae family)

143. A HIV-positive patient develops persistent oral hairy leukoplakia on the lateral tongue. What management is typically indicated if it becomes symptomatic or cosmetically concerning?
(A) High-potency topical steroids
(B) Antibiotic rinses
(C) Antiviral therapy (e.g., high-dose acyclovir or valacyclovir)
(D) Intraoral laser ablation only

144. Which key microscopic feature is seen in pseudomembranous candidiasis?
(A) Fungal hyphae and pseudohyphae invading the superficial keratin layer
(B) Intranuclear viral inclusions
(C) Granulomatous reaction with giant cells
(D) Spirochete infiltration

145. Which statement regarding syphilitic lesions in the oral cavity is INCORRECT?
(A) Primary syphilis presents as a chancre, often a painless ulcer
(B) Secondary syphilis can show oral mucous patches
(C) Tertiary syphilis may produce gumma affecting the palate or tongue
(D) Oral syphilis is fully prevented by prophylactic antibiotic mouthwashes

146. Which condition is more likely to affect immunocompromised patients, resulting in multiple non-healing oral ulcers often found on keratinized mucosa?
(A) Recurrent aphthous stomatitis
(B) Minor traumatic ulcers
(C) Herpes simplex virus reactivation (HSV) in immunocompromised hosts
(D) Condyloma acuminatum

147. Poor denture hygiene leading to chronic plaque accumulation on dentures often results in:
(A) Xerostomia
(B) Denture stomatitis (chronic atrophic candidiasis)
(C) Traumatic fibroma
(D) Herpetic whitlow

148. A 7-year-old child experiences acute gingivostomatitis with fever, multiple oral ulcers, and swollen gums. HSV-1 infection is confirmed. What is the mainstay of management?
(A) Topical steroids
(B) High-dose antibiotics
(C) Supportive care and hydration, possibly antiviral therapy
(D) Radical surgical debridement

149. A 32-year-old HIV-positive patient has a 3-month history of painful non-healing ulcer on the hard palate. Biopsy shows granulomatous inflammation with branching fungal organisms consistent with histoplasmosis. Which factor most likely predisposed this patient to oral histoplasmosis?
(A) Excess carbohydrate intake
(B) Immunosuppression due to HIV
(C) Superficial candida coinfection
(D) Frequent consumption of unpasteurized milk

150. A patient diagnosed with mucormycosis (zygomycosis) of the maxilla requires urgent treatment. Which combination is most appropriate?
(A) Surgical debridement and high-dose amphotericin B
(B) Antibiotics and low-dose nystatin
(C) Antiviral therapy and observation
(D) Topical antiseptics alone

151. Forensic odontology is best defined as the branch of dentistry that:
(A) Focuses solely on orthodontic treatment planning
(B) Investigates the role of dietary habits in caries formation
(C) Applies dental knowledge to legal and criminal issues

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(D) Exclusively examines bite force in sports-related injuries

152. Which method is commonly used for age estimation in forensic odontology?
(A) Cephalometric radiography of the frontal sinus
(B) Assessing pulp chamber size via radiographs of the teeth
(C) Direct measurement of alveolar crest height
(D) Palpation of the temporomandibular joint

153. Why are teeth considered particularly reliable for identifying human remains?
(A) They are composed of purely organic material that decays quickly
(B) Their anatomic variability is extremely uniform among all individuals
(C) They are highly resistant to decomposition, fire, and environmental extremes
(D) They are more easily damaged than bone and rarely remain intact

154. All of the following details can be derived from dental records to aid in identification EXCEPT:
(A) Presence of restorations or implants
(B) Tooth alignment and occlusal relationships
(C) Sequence of extracted or missing teeth
(D) Exact DNA profile of the suspect from an intraoral photograph

155. How does bite mark analysis differ from fingerprint analysis in forensic practice?
(A) Bite mark patterns are more standardized than fingerprint patterns
(B) Fingerprints can be collected from living individuals, whereas bite marks cannot
(C) Bite mark analysis can be complicated by skin elasticity and distortion, whereas fingerprints are more stable
(D) Fingerprint analysis depends on dental wax impressions

156. When comparing bite marks, which factor most significantly increases the evidentiary value in court?
(A) The mark is faint and obscured by bruising
(B) Clear, well-defined arches and tooth imprints with consistent spacing
(C) Multiple overlapping bite marks on the same site
(D) The mark is located on highly mobile tissue, such as the cheek

157. Which scenario best illustrates the practical use of antemortem (AM) and postmortem (PM) dental record comparison for identification?
(A) Matching the shape of alveolar bone between two random skulls
(B) Comparing a victim's PM facial photograph with a suspect's AM X-ray
(C) Using the same individual's known AM dental radiographs to evaluate PM remains
(D) Estimating the suspect's occupation from teeth stains alone

158. A body recovered from a fire has mostly calcined bones. The dental arches are partially intact. Which immediate forensic odontology step should be taken?
(A) Discard the teeth as they are likely damaged
(B) Perform DNA extraction from alveolar bone
(C) Retrieve and label each tooth fragment carefully for radiographic comparison
(D) Rely solely on eyewitness testimony

159. Which key feature in a bite mark may allow the forensic odontologist to recognize a specific suspect's unique dental trait?
(A) A general semicircle with no distinct tooth boundaries
(B) Overlapping incisal imprints from two or more teeth that appear fused
(C) A diastema between upper central incisors clearly visible in the mark
(D) Shallow indentations that lack any morphological detail

160. Which statement is INCORRECT regarding forensic dental age estimation methods?
(A) Tooth eruption patterns can help estimate a child's chronological age
(B) Pulp/tooth ratio changes on radiographs are used in adults
(C) Dental development stages are unaffected by severe nutritional deficiencies
(D) Cementum incremental lines can offer age-related data

161. Which factor most significantly increases the probability of a successful dental identification of unknown remains?
(A) Availability of high-quality antemortem dental records for comparison
(B) The presence of extremely severe dental wear in the remains
(C) Unknown cause of death in the remains
(D) Absence of any dental restorations or anomalies

162. Why does advanced periodontal disease complicate identification through dental records?
(A) It eliminates all tooth anatomy, making shape comparisons impossible
(B) It often leads to multiple extractions or tooth loss, reducing available comparative points
(C) It reverses old restorations, generating new fillings
(D) It permanently prevents radiographic evaluation

163. A deceased individual is found with a partial denture labeled on the metal framework. What is the primary forensic significance of this finding?
(A) Confirms national origin
(B) Provides a direct link to antemortem dental records
(C) Proves the cause of death
(D) Identifies presence of advanced periodontal disease

164. An unidentified burn victim has intact maxillary teeth with notable gold foil restorations. Dental radiographs show a distinctive root canal shape in tooth #11 and a porcelain crown on #7. Investigators locate records from a local dentist describing exactly these features. What is the most likely conclusion regarding identity?
(A) Partial match, more tests needed
(B) Positive identification based on matching dental restorations and root canal forms
(C) Inconclusive result requiring DNA analysis
(D) No correlation, as gold foil is common

165. A 22-year-old woman is reported missing after a hiking trip. Weeks later, skeletal remains with partial dentition are found near the trail. Her family provides her last dental X-rays. Which initial forensic odontological step is critical for identification?
(A) Visualizing and comparing radiographic landmarks
(B) Taking extraoral photographs only
(C) Testing root surfaces for heavy metal content
(D) Attempting direct facial reconstruction

166. A 46-year-old male laborer, known to have multiple tooth extractions and distinctive bridges, dies in a warehouse fire. The body is charred, limiting facial recognition. The forensic dentist's evaluation finds eight missing teeth with healed sockets, a fixed bridge replacing teeth #2-#4, and a complex gold onlay on tooth #15. Family members recall he had major dental work done 10 years ago, but no dentist is listed. How should the forensic dentist proceed to confirm identity, given these extensive but undocumented dental restorations?
(A) Abandon dental identification due to lack of records
(B) Conduct local searches for possible antemortem dental providers
(C) Disregard the gold onlay and rely on direct DNA
(D) Label the remains as unidentified

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167. In a mass disaster scenario, which protocol is widely followed for forensic dental identification?
(A) FDI (Fédération Dentaire Internationale) Section 3 protocol
(B) DVI (Disaster Victim Identification) Interpol protocol
(C) AAP (American Academy of Periodontology) guidelines
(D) NIH standard for medical research

168. In bite mark analysis on a victim's arm, which sign might indicate the perpetrator's incisor had a chipped edge?
(A) Perfect semicircle with uniform rectangular impressions
(B) An elongated tear at the canine region
(C) A small notch or irregular break in the incisal perimeter of the mark
(D) Parallel lines left by the upper and lower arches

169. Assertion: DNA can sometimes be extracted from the pulp chamber or saliva on recovered bite marks. Reason: Teeth and saliva harbor genetic material that remains stable under certain conditions.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

170. A domestic assault case involves distinct bite marks on the victim's neck. The defense argues it's a bruise. What forensic step can help confirm it as a bite mark?
(A) Observing cusp tip patterns
(B) Checking viral loads
(C) Documenting victim's gingival health
(D) Evaluating alveolar crest height

171. A suspect's dental impression is taken to compare with a bite mark found on a murder victim's forearm. The forensic dentist notes spacing between the suspect's canines is unusually wide. If the bite mark similarly shows that distinctive spacing, how will this information likely be used in court?
(A) Exclude the suspect based on mismatch
(B) Provide circumstantial evidence but not strong enough for identification
(C) Serve as a potentially strong corroborative feature linking suspect to the bite
(D) Nullify all other forensic evidence

172. What is rugoscopy in forensic odontology?
(A) Analysis of incisal wear facets
(B) Examination of lip prints
(C) Study of palatal rugae patterns
(D) Measurement of alveolar bone loss around teeth

173. Which classification system is often used to note tooth positions in forensic odontology on an international scale?
(A) Zsigmondy-Palmer notation
(B) Universal Numbering System (1–32)
(C) Federation Dentaire Internationale (FDI) two-digit system
(D) Palmer bracket system

174. Why might lip print (cheiloscopy) evidence be considered supportive rather than conclusive in forensic cases?
(A) Lip prints are always identical between individuals
(B) Lip prints cannot be photographed accurately
(C) Lips are highly mobile and subject to smudging or distortion
(D) Lip print analysis is recognized as having 100% specificity

175. All of the following forensic details can be gleaned from the dentition EXCEPT:
(A) Previous orthodontic treatment
(B) Handedness of the deceased
(C) Cultural or habitual tooth modifications

(D) Presence of congenital anomalies like supernumerary teeth

176. How does fluorescent labeling of restorations aid forensic investigations differently than standard radiographic records?
(A) Fluorescent labels help in diagnosing caries, whereas radiographs do not
(B) They enable immediate determination of cause of death
(C) They allow visual detection of restorations in remains when radiographs are unavailable or inconclusive
(D) They render the restorations radio-opaque in all instances

177. In a sexual assault case, a perpetrator's bite mark is found on the victim's shoulder. Which procedure is most appropriate to preserve the evidence?
(A) Delay any examination until bruising fades
(B) Photograph the bite mark with a ruler scale and take a saliva swab
(C) Immediately apply antiseptic ointment, ignoring photography
(D) Reproduce the mark on the suspect's arm

178. A decayed tooth is found near a shallow grave site with no other skeletal remains. Which forensic approach might be attempted?
(A) Dismiss it as non-human
(B) Attempt to analyze the tooth's morphology for human vs. animal origin, then use DNA if feasible
(C) Immediately assume it's from the missing victim
(D) Perform full postmortem autopsy

179. A severely burnt jaw fragment is retrieved at a disaster site. Radiographic evaluation shows partial root forms. Which immediate step should the forensic odontologist take to facilitate potential identification?
(A) Attempt forced prying of the teeth from the jaw
(B) Stabilize and label the fragment and proceed with forensic dental imaging
(C) Immerse it in acid for quicker cleaning
(D) Send it directly for a reconstructive facial overlay

180. Which key feature in postmortem dental profiling might point to cultural influences on dentition?
(A) Numerous carious lesions from poor oral hygiene
(B) Intact, unaltered premolars
(C) Decorative inlays or intentional filing of anterior teeth
(D) A typical arrangement of 28 permanent teeth

181. Which statement is INCORRECT regarding the role of DNA in forensic odontology?
(A) DNA can be extracted from pulp tissue for identification
(B) Saliva on bite marks can yield usable DNA
(C) Restorative materials themselves are a direct source of nuclear DNA
(D) DNA profiling can confirm or refute antemortem assumptions

182. In a case of multiple skeletons excavated from an unmarked grave, which factor would most likely increase the likelihood of antemortem/postmortem dental match success?
(A) Each skeleton lacking any restorations
(B) Multiple unique dental restorations or anomalies for each skeleton
(C) The use of standard universal numbering exclusively
(D) The skeletons belonging to the same age group

183. Why do teeth with root canal therapy frequently help confirm identity?
(A) The root canal filling always carries the patient's DNA
(B) They guarantee the presence of alveolar bone defects
(C) They exhibit characteristic radiopaque filling shapes that can match antemortem radiographs
(D) They automatically reduce dental pulp size in all individuals

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184. A battered body is discovered with advanced decomposition. The victim's mother produces bitewing radiographs from three years ago. How can the forensic dentist utilize these images for identification?
(A) Obtain 3D scans only
(B) Compare alveolar crest levels
(C) Match restorations, root contours, and anatomical landmarks
(D) Ignore them, as they are too old

185. A 35-year-old assault victim sustained multiple human bite injuries to the forearms and shoulders. The suspect denies biting, claiming the marks are from the victim's own nails. The forensic odontologist performs a detailed analysis of arcs, tooth width, and incisal forms. What conclusion might substantiate the victim's account?
(A) The pattern clearly indicates inter-canine distance and distinct incisal shapes, matching a human dentition
(B) The marks show linear scratch patterns consistent with fingernails
(C) The arcs correspond to a partial foot imprint
(D) The evidence is inconclusive due to contusion overlap

186. In a homicide investigation with unidentified burned remains, the coroner suspects advanced root canal therapy in several teeth. Which specialized imaging technique could help visualize root canal fillings when standard X-rays are unclear?
(A) Ultrasonography
(B) Infrared thermography
(C) Cone-beam computed tomography (CBCT)
(D) MRI of the alveolar processes

187. Which sign in postmortem jaws might indicate a specific antemortem trauma that helps confirm identity?
(A) Occlusal wear
(B) Fractured alveolar bone corresponding to a documented jaw injury
(C) Loss of deciduous teeth
(D) High presence of calculus

188. Which statement about digital dental record archiving for forensic use is INCORRECT?
(A) Digital records can be annotated with details of restorations, periodontal status, and previous trauma
(B) They allow faster retrieval and secure sharing with forensic teams
(C) They remain impervious to data corruption or accidental deletion
(D) They can store high-resolution images for clear comparisons

189. Which factor most enhances the likelihood of matching bite mark DNA from a crime scene?
(A) The suspect heavily smoked before biting
(B) Immediate swabbing of the bite area for saliva
(C) The bite mark is on a highly mobile tissue, making it difficult to collect
(D) The victim washed the area thoroughly just after the bite

190. Why can antemortem extraction of multiple teeth hinder future forensic identification?
(A) It guarantees no alveolar bone remains
(B) It transforms the mouth into a standard edentulous arch
(C) It reduces or eliminates unique dental features that could match prior records
(D) It always leads to insertion of easily traceable implants

191. A suspect with unique spiral fractures in his incisors is accused of assault involving a bite mark. Which comparison detail would be pivotal in linking him to the injury?
(A) General arch shape
(B) Spiral cracks reproducing in the bite impression
(C) Soft tissue lacerations only
(D) Victim's RBC count

192. During a flood disaster, numerous decomposed bodies are recovered. A forensic dentist notes that several victims have gold crowns, while some have unusual tooth wear patterns. The local health department has partial records for only a few. Which primary forensic step can help maximize identification success in this scenario?
(A) Cremating unidentified remains
(B) Taking panoramic radiographs of all jaws and comparing them with any available local records
(C) Collecting fingernail clippings from each body
(D) Relying purely on witness testimonies

193. When suspect and victim bite mark patterns do not align closely, but partial similarities exist, how do forensic experts typically proceed?
(A) Conclusively identify the suspect as the biter
(B) Exclude the suspect without further analysis
(C) Label the evidence as inconclusive or partial match, seeking additional corroboration
(D) Rely on the suspect's confession only

194. Which key action ensures proper chain of custody for dental evidence recovered at a crime scene?
(A) Leaving the evidence unlabeled until the lab is ready
(B) Clearly labeling, sealing, and documenting each item's transfer among personnel
(C) Allowing any bystander to handle the evidence temporarily
(D) Storing the evidence in an open plastic bag without sealing

195. Which statement about bitemark evidence in legal proceedings is INCORRECT?
(A) Its reliability has been scrutinized, requiring cautious interpretation
(B) Perfect matches are rare due to tissue distortion
(C) It is universally accepted as indisputable proof of guilt
(D) DNA from saliva on the mark can add corroboration

196. Which aspect of a child's dentition makes identification more probable when antemortem data are available?
(A) Deciduous teeth never fall out
(B) The distinct pattern of mixed dentition with partially erupted permanent teeth can match exactly to radiographs
(C) The child's teeth do not show any unique patterns
(D) An underdeveloped alveolar process lacks identifying features

197. Frequent contact between forensic odonatologists and local dental clinics can lead to:
(A) Violation of patient privacy laws
(B) Quicker access to antemortem records during investigations
(C) Fewer suspicious bite mark cases
(D) Mandatory universal registration of all patients

198. A homicide investigation involves a female suspect who left a suspected bite mark on the male victim's chest. How might the forensic dentist confirm if it originated from a female dentition?
(A) Checking hormone levels in saliva
(B) Demonstrating characteristic arch width and tooth size patterns consistent with typical female metrics
(C) Relying on foot size correlation
(D) Testing the blood group from the mark

199. During disaster victim identification, a forensic odontology team encounters multiple bodies with severe skull fractures. Some jaws are detached from crania. The lead forensic dentist advises collecting each mandible separately and labeling them. Which protocol aspect does this represent, and why is it crucial?
(A) Minimizing duplication of evidence, ensuring each part is tracked
(B) Combining all bone fragments for a communal ID
(C) Disposal of small fragments
(D) Retaining only maxillae

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200. A skeleton with a distinct “U”-shaped palate and multiple gold crowns is presumed to be a missing person who had similar dental work. To definitively confirm, which step completes the forensic odontology procedure?

(A) Visualizing alveolar process thickness only
(B) Submitting the skeleton for a second autopsy
(C) Matching antemortem radiographs or dental notes describing the same unique shape and crowns
(D) Confirming cause of death

CHAPTER 03

ORAL AND MAXILLOFACIAL SURGERY

1. Surgical asepsis in oral and maxillofacial procedures primarily focuses on:
   (A) Minimizing inhalational agents
   (B) Eliminating or reducing pathogenic microorganisms
   (C) Increasing blood flow through the use of vasodilators
   (D) Enhancing patient comfort via sedation

2. Which of the following investigations is most crucial for evaluating bleeding tendencies prior to oral surgery?
   (A) Serum electrolyte panel
   (B) Complete blood count with platelet count
   (C) Liver function test
   (D) Prothrombin time (PT) and INR

3. In the context of patient assessment for oral surgery, "ASA Classification" refers to:
   (A) A standardized risk index to classify antibiotic sensitivity
   (B) An anesthetic scoring system created by surgeons
   (C) A method to categorize patients by physical status and systemic health
   (D) A universal charting system for documenting dental pathology

4. Which of the following is NOT a standard component of preoperative patient evaluation in oral surgery?
   (A) Comprehensive medical history
   (B) Vital signs assessment
   (C) Radiographic imaging of the operative site
   (D) Routine echocardiogram for all patients

5. Compared to non-diabetic patients, diabetic individuals undergoing oral surgery generally:
   (A) Have a lower risk of postoperative infection
   (B) Experience faster wound healing
   (C) Require no antibiotic prophylaxis
   (D) Are more susceptible to impaired wound healing

6. What is the best immediate step to minimize infection risk when a sterile glove is accidentally torn during an oral surgical procedure?
   (A) Quickly cover the tear with sterile gauze and continue
   (B) Change to a new sterile glove promptly
   (C) Irrigate the glove with sterile saline and proceed
   (D) Ask the assistant to suture the tear in the glove

7. A patient with a known seizure disorder presents for extraction of multiple teeth. Which precautionary measure is most critical before beginning the procedure?
   (A) Place an oxygen tank next to the dental chair
   (B) Obtain a neurological consultation for sedation clearance
   (C) Ensure the patient has taken antiepileptic medication and verify levels
   (D) Instruct the patient to fast for 12 hours

8. When reviewing a patient's medical history prior to oral surgery, which detail is particularly important to note to prevent hemorrhagic complications?
   (A) History of asthma
   (B) Regular use of over-the-counter antihistamines
   (C) Long-term corticosteroid usage
   (D) Regular use of anticoagulants or antiplatelet drugs

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9. In preparing a patient for minor oral surgery under local anesthesia, which step is INCORRECT?
(A) Explaining the procedure and obtaining informed consent
(B) Performing a thorough intraoral antiseptic rinse
(C) Administering prophylactic antibiotics to all patients without risk assessment
(D) Checking for contraindications to local anesthetics

10. Which condition increases the likelihood of postoperative dry socket (alveolar osteitis) following tooth extraction?
(A) Well-controlled diabetes
(B) Careful adherence to postoperative instructions
(C) Smoking immediately after extraction
(D) Use of chlorhexidine mouthrinse

11. In patients with uncontrolled hypertension, how does elevated blood pressure most directly affect oral surgical outcomes?
(A) Increases risk of local anesthesia failure
(B) Lowers chance of soft-tissue damage
(C) Raises the probability of intraoperative hemorrhage
(D) Reduces postoperative infections significantly

12. A 52-year-old male with poorly controlled diabetes and obesity is scheduled for a minor oral surgery. He reports frequent episodes of hyperglycemia and delayed wound healing in the past.
Which measure is the best initial step?
(A) Proceed with the surgery using prophylactic antibiotics
(B) Optimize glycemic control before scheduling surgery
(C) Rely on thorough wound irrigation post-surgery
(D) Provide only local anesthesia without sedation

13. During a preoperative exam, a patient presents with severe halitosis, fever, and localized swelling around a lower molar. You suspect an acute odontogenic infection. Which is the most appropriate next diagnostic step?
(A) Prescribe broad-spectrum antibiotics immediately
(B) Obtain periapical and panoramic radiographs
(C) Schedule an immediate extraction
(D) Perform a random blood sugar test only

14. A patient on chronic steroid therapy is planned for a minor oral surgery under local anesthesia. What perioperative management is recommended?
(A) Discontinue steroids completely 24 hours before the procedure
(B) Provide supplemental steroid dose to avoid adrenal crisis
(C) Switch to a non-steroidal anti-inflammatory drug
(D) No change required if procedure is minor

15. According to standard infection control guidelines, which item must be sterilized between patients?
(A) Light handle covers
(B) Patient bib clips
(C) Disposable saliva ejectors
(D) Autoclavable metal instruments

16. During a pre-surgical consult, a patient reports night sweats, fever, and unexplained weight loss. Which condition should be ruled out first before elective oral surgery?
(A) Dental caries
(B) Undiagnosed tuberculosis
(C) Vitamin deficiency
(D) Seasonal allergic rhinitis

17. In evaluating a suspected oral cancer lesion before surgery, which is a key clinical sign that warrants immediate biopsy?
(A) Persistent ulcer with rolled, indurated margins
(B) Superficial erosions without tissue hardening
(C) Smooth, painless swelling lasting one week
(D) Mild gingival bleeding after brushing

18. Assertion: A complete medical history is mandatory before performing any oral surgery.
Reason: Patients may have undiagnosed systemic conditions that increase surgical risk.
(A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation for Assertion.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, and Reason is true.

19. If a patient has severe anxiety regarding oral surgery, the first management step is typically:
(A) Intravenous sedation
(B) Calm, informative communication and reassurance
(C) Restraint by additional staff
(D) Referral to a psychiatrist immediately

20. Which imaging modality provides a three-dimensional view crucial for complex oral surgical assessments, such as implant site evaluation?
(A) Periapical radiograph
(B) Panoramic radiograph
(C) Cephalometric radiograph
(D) Cone Beam Computed Tomography (CBCT)

21. A 43-year-old patient with a history of controlled hypertension needs extraction of a fractured premolar. He expresses concern about intraoperative pain control.
What is the safest approach?
(A) Use a vasoconstrictor-free local anesthetic
(B) Use local anesthetic with epinephrine at low concentration
(C) Avoid local anesthetics and use IV sedation
(D) Apply only topical anesthesia

22. A 39-year-old female with a significant smoking history and controlled diabetes is scheduled for alveoloplasty before denture fabrication. She has had persistent sinusitis and a history of multiple upper respiratory infections.
Which systemic factor warrants utmost attention?
(A) Smoking habit
(B) Controlled diabetes
(C) Recurrent sinusitis
(D) Previous dental extractions

23. Which principle best describes the rationale for prescribing antibiotics only when necessary in oral surgery?
(A) To reduce operating room time
(B) To maintain immune cells in an inactive state
(C) To prevent antibiotic resistance and adverse reactions
(D) To eliminate the possibility of tissue healing

24. In the context of patient assessment for oral surgery, "informed consent" is best defined as:
(A) An optional document signed by the patient
(B) A process of providing detailed procedure information and obtaining voluntary agreement
(C) A verbal understanding requiring no documentation
(D) A legal guarantee that complications will not occur

25. Which pharmacological agent is commonly used to reverse opioid-induced respiratory depression in an emergency?
(A) Flumazenil
(B) Naloxone
(C) Atropine
(D) Epinephrine

26. In assessing pain for a patient requiring oral surgery, which is true regarding subjective versus objective measures?
(A) Subjective measures are more reliable than objective ones
(B) Objective measures eliminate the need for patient feedback

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(C) Both subjective and objective measures should be used together
(D) Pain assessment is purely physiological, not influenced by emotions

27. A 60-year-old patient with moderate COPD requires a minor oral surgical procedure. What is the best anesthetic approach?
(A) General anesthesia with nitrous oxide
(B) Local anesthesia with sedation, ensuring minimal respiratory depression
(C) Deep sedation with benzodiazepines without supplemental oxygen
(D) No anesthesia to avoid respiratory compromise

28. A patient allergic to penicillin needs prophylaxis prior to an oral surgery. Which antibiotic is often used as an alternative?
(A) Amoxicillin
(B) Erythromycin or clindamycin
(C) Metronidazole
(D) Cephalexin

29. When planning the incision design in oral surgery, the most critical principle is to:
(A) Make the incision as small as possible
(B) Ensure minimal reflection of the mucoperiosteum
(C) Provide adequate visibility while preserving blood supply
(D) Avoid crossing the midline of the palate

30. Which practice is INCORRECT during the management of a medically compromised patient undergoing oral surgery?
(A) Consulting with the patient's physician when systemic conditions are unstable
(B) Modifying treatment based on the patient's medical history
(C) Proceeding without laboratory tests even if indicated
(D) Adjusting medication schedules in coordination with prescribing physicians

31. In oral surgery, "exodontia" specifically refers to:
(A) Cosmetic repair of dental prostheses
(B) Extraction of teeth
(C) Alveoloplasty procedures
(D) Periodontal surgeries

32. Which instrument is primarily used for the luxation of a tooth before extraction?
(A) Surgical handpiece
(B) Periosteal elevator
(C) Dental elevator
(D) Bone chisel

33. Why is a proper flap design often required during surgical extraction?
(A) To increase procedure time
(B) To secure the tooth more firmly in the socket
(C) To allow sufficient access and visibility
(D) To reduce bone healing and encourage complications

34. Which of the following does NOT typically indicate surgical extraction over routine extraction?
(A) Severely decayed crown missing coronal structure
(B) Horizontal impaction of the third molar
(C) Adequate tooth structure for forceps application
(D) Divergent roots in a molar requiring sectioning

35. Compared to closed forceps extraction, an open surgical approach for removing a tooth:
(A) Requires no flap design
(B) Is typically used for mobile, intact teeth
(C) Involves bone removal or sectioning of the tooth
(D) Reduces the need for local anesthesia

36. A fractured root tip remains in the socket after extracting a molar. The best immediate course of action is to:
(A) Leave it in place without informing the patient
(B) Forcefully use a hemostat to pull it out

(C) Gently attempt retrieval with a root tip pick or minimal bone removal
(D) Schedule another appointment in a week to remove it

37. During extraction of a lower molar, you encounter moderate resistance. To minimize jaw strain and potential temporomandibular joint (TMJ) discomfort, you should:
(A) Use excessive force and quick, jerky motions
(B) Apply controlled, gradual forces with proper support
(C) Continuously twist the tooth clockwise and counterclockwise
(D) Ask the patient to move their jaw to assist

38. After extracting a tooth, the patient continues to bleed abnormally. Your immediate next step should be:
(A) Inform the patient to go home and rest
(B) Apply direct pressure with a sterile gauze pack
(C) Place sutures without localizing the bleeding source
(D) Begin intravenous antibiotics

39. Which measure is essential to prevent dry socket after a routine extraction?
(A) Aggressive curettage of the socket
(B) Advising the patient to vigorously rinse right after surgery
(C) Maintenance of a stable blood clot in the socket
(D) Leaving the socket open without a clot

40. In performing a routine forceps extraction, which action is INCORRECT?
(A) Using a bite block for patient comfort and stabilization
(B) Applying controlled, slow force to the tooth
(C) Forcing the mouth open beyond its normal range
(D) Checking local anesthesia before initiating the extraction

41. In smokers undergoing tooth extractions, what is the increased likelihood of developing postoperative complications like dry socket compared to non-smokers?
(A) Significantly lower
(B) About the same
(C) Slightly higher
(D) Significantly higher

42. Excessive force during tooth extraction can lead to fractured alveolar bone. This fracture most commonly occurs:
(A) On the lingual aspect of mandibular molars
(B) In the anterior maxilla
(C) At the floor of the maxillary sinus
(D) In the thin buccal cortical plate of maxillary premolars

43. A 25-year-old patient complains of persistent pain and swelling three days after lower molar extraction. He reports foul taste and odor in the mouth.
What is the most likely diagnosis?
(A) Dry socket
(B) Osteomyelitis
(C) Normal postoperative pain
(D) Allergic reaction

44. During an extraction, you notice the root tip is displaced into the maxillary sinus. What should be done next?
(A) Leave it as it is if there is no infection
(B) Attempt retrieval through the socket or a Caldwell-Luc approach
(C) Prescribe antibiotics and wait for spontaneous eruption
(D) Seal the socket with a collagen membrane and ignore the root tip

45. A patient with bleeding disorder requires a tooth extraction. Which step is most crucial before proceeding?
(A) Perform a routine extraction under local anesthesia
(B) Coordinate with a hematologist to optimize factor levels

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(C) Schedule multiple teeth extractions in one visit
(D) Use minimal sedation to avoid stress

46. According to standard guidelines, patients advised for tooth extraction on antiplatelet therapy (e.g., aspirin) typically:
(A) Must discontinue aspirin at least two weeks prior
(B) Can often continue aspirin without interruption for minor extractions
(C) Need daily INR monitoring
(D) Require bridging therapy with heparin

47. A patient reports acute onset of severe facial swelling and difficulty swallowing the day after a lower molar extraction. Which serious complication should be suspected first?
(A) Normal postoperative edema
(B) Ludwig's Angina
(C) Minor allergic reaction
(D) TMJ dislocation

48. Which of the following symptoms most strongly suggests an oro-antral communication after an upper molar extraction?
(A) A popping sound during chewing
(B) Numbness in the lip region
(C) Air escaping into the mouth when the patient blows their nose
(D) Excessive bleeding that cannot be controlled

49. Assertion: Immediate denture placement after multiple extractions can help maintain facial esthetics.
Reason: The alveolar ridge undergoes rapid resorption post-extraction, affecting facial appearance.
(A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation for Assertion.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, and Reason is true.

50. A patient with a recent history of myocardial infarction (six weeks ago) requires a non-urgent tooth extraction. According to typical guidelines, the best approach is:
(A) Proceed immediately without consultation
(B) Wait for at least six months for stabilization
(C) Consult the cardiologist and consider delaying until the patient is medically stable
(D) Perform the extraction under general anesthesia in a hospital

51. "Elevator purchase point" in tooth extraction refers to:
(A) The initial finger rest used to stabilize the elevator handle
(B) The support area on the adjacent tooth during luxation
(C) A small, deliberate notch in bone or tooth surface to engage the elevator tip
(D) The point on the gum where infiltration anesthesia is administered

52. Which local anesthetic complication is most commonly encountered during mandibular molar extractions?
(A) Allergic reaction to lidocaine
(B) Facial nerve paralysis due to infiltration near the parotid gland
(C) Hematoma formation in the pterygomandibular space
(D) Displacement of the anesthetic cartridge into the tissues

53. During a lower anterior tooth extraction, why is caution required to protect the lingual soft tissues?
(A) The lingual nerve courses near the premolar region, so it's not relevant
(B) The tissue is too thick for any damage to occur
(C) The sublingual artery is superficial and can be easily compressed
(D) Instruments can slip lingually and cause laceration to the floor of the mouth

54. Which of these steps is NOT recommended when dealing with a medically compromised patient during a challenging tooth extraction?
(A) Scheduling shorter, less stressful appointments
(B) Ensuring supplemental oxygen is readily available
(C) Performing unplanned multiple extractions in a single session
(D) Checking vital signs frequently throughout the procedure

55. Compared to a single-rooted tooth extraction, multi-rooted tooth extraction often:
(A) Requires less anesthetic
(B) Demands more time and possibly sectioning of roots
(C) Results in negligible postoperative pain
(D) Has fewer complications related to the alveolar bone

56. In cases where the root apex is close to the mandibular canal, the best preoperative imaging choice to minimize nerve injury risk is:
(A) Standard periapical radiograph
(B) Occlusal radiograph
(C) Panoramic radiograph only
(D) Cone Beam Computed Tomography (CBCT)

57. A patient is on dual antiplatelet therapy (aspirin and clopidogrel) and needs a lower premolar extracted. The recommended approach is:
(A) Stop both medications for one week before extraction
(B) Proceed without altering medications and use local hemostatic measures
(C) Switch to warfarin for one month
(D) Perform the extraction only under general anesthesia

58. Immediately following a difficult molar extraction, the dentist notices significant osseous exposure in the socket. Which measure helps promote healthy granulation?
(A) Vigorous curettage of all soft tissue
(B) Placement of a soothing dressing or gel foam
(C) Prolonged instrumentation with a high-speed bur
(D) Application of hydrogen peroxide for 10 minutes

59. In performing a closed extraction of a mobile lower incisor, which action is INCORRECT?
(A) Using minimal force once the tooth is luxated
(B) Using rotational movements suitable for conical or single roots
(C) Elevating a full-thickness flap
(D) Checking soft tissue for any tears post-extraction

60. In patients who do not follow postoperative instructions after a routine molar extraction, the likelihood of developing complications such as infection or dry socket is:
(A) Unchanged
(B) Decreased by half
(C) Significantly increased
(D) Eliminated through immune response

61. Excessive horizontal traction forces during an extraction primarily risk fracturing:
(A) The mesial root apex of the tooth
(B) The existing crowns of adjacent teeth
(C) The alveolar socket wall
(D) The alveolar crest in the maxillary anterior region

62. A 55-year-old patient with controlled hypertension and mild osteoporosis attends for a lower molar extraction. Recent radiographs show thinning of cortical bone but normal tooth anatomy.
Which consideration is crucial?
(A) Stop antihypertensive medication
(B) Apply stronger forces for quicker extraction
(C) Use gentle luxation to avoid bone fracture
(D) Withhold local anesthesia to monitor pain feedback

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63. After an extraction, a patient reports persistent numbness in the lower lip and chin area. Which nerve injury is suspected?
(A) Mental nerve
(B) Buccal nerve
(C) Glossopharyngeal nerve
(D) Lingual nerve

64. A patient with renal impairment needs multiple extractions. Which modification is crucial for their treatment plan?
(A) Scheduling early in the morning after dialysis if needed
(B) Using high doses of nephrotoxic analgesics
(C) Performing the extraction without local anesthesia
(D) Avoiding antibiotic coverage for fear of side effects

65. According to best practice guidelines, what is the recommended immediate management for a tooth socket suspected of an oro-antral communication?
(A) Direct the patient to blow their nose to confirm sinus opening
(B) Suture the socket with a figure-of-eight suture and reassess
(C) Leave it to heal spontaneously without intervention
(D) Place a gauze pack for 24 hours and observe

66. Severe postoperative pain and trismus one day after a lower molar extraction can be a red flag for:
(A) Unrelated TMJ dysfunction
(B) Alveolar osteitis developing on the first day
(C) Muscle or fascial space infection (e.g., early infection in the masseteric space)
(D) Normal healing response

67. Which symptom strongly suggests a fractured maxillary tuberosity during a posterior tooth extraction?
(A) Radiating pain to the lower jaw
(B) Palpable mobility of the surrounding alveolar process
(C) Tingling in the lingual mucosa
(D) Mild oozing of blood immediately post-extraction

68. Assertion: Subperiosteal abscesses can occur after extractions if bony fragments or debris remain.
Reason: Retained foreign objects beneath the periosteum may foster infection and suppuration.
(A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation for Assertion.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, and Reason is true.

69. For a pediatric patient requiring a difficult extraction of a deciduous molar, the recommended sedation approach often includes:
(A) Deep IV sedation without monitoring
(B) Inhalation sedation with nitrous oxide and oxygen
(C) General anesthesia in a non-equipped office
(D) Complete avoidance of sedation to ensure cooperation

70. You suspect root displacement into the submandibular space during a mandibular molar extraction. Which imaging is typically ordered for definitive localization?
(A) Lateral oblique mandibular radiograph
(B) Cephalometric radiograph
(C) Cone Beam Computed Tomography (CBCT)
(D) Occlusal radiograph

71. A 28-year-old patient presents with painful swelling around a partially erupted lower third molar. Radiographs show a mesioangular impaction close to the mandibular canal.
What is the primary concern?
(A) Risk of dry socket after extraction
(B) Potential nerve injury during surgical removal
(C) Quick resolution with antibiotic therapy alone
(D) Spontaneous eruption of the impacted tooth

72. A 25-year-old with recurrent pericoronitis around an impacted lower wisdom tooth has tried conservative treatments (irrigation, antibiotics) multiple times. Radiographic evaluation confirms minimal space for eruption. He complains of persistent pain radiating to the ear.
Which management is indicated?
(A) Continued antibiotic cycles
(B) Operculectomy alone
(C) Surgical extraction of the impacted tooth
(D) Referral for physiotherapy

73. "Coronectomy" is defined as:
(A) Complete removal of the impacted tooth, including its roots
(B) Partial surgical removal of the crown while intentionally retaining the roots
(C) Simple excision of the operculum overlying a wisdom tooth
(D) Removal of only the pulp tissue but leaving tooth structure intact

74. Which blade design is most commonly used for creating a standard mucoperiosteal flap in impacted third molar surgery?
(A) No. 11 blade
(B) No. 12 blade
(C) No. 15 blade
(D) No. 10 blade

75. In mandibular third molar surgery, "sectioning the tooth" is performed to:
(A) Increase patient discomfort and slow procedure
(B) Facilitate removal by dividing the crown and roots
(C) Prevent the formation of a blood clot
(D) Remove more bone than necessary

76. Which scenario is NOT typically an indication for removing an impacted third molar?
(A) Repeated pericoronitis
(B) Compromised adjacent tooth due to caries from the impacted tooth
(C) Asymptomatic fully impacted tooth with no pathology
(D) Evidence of cystic formation around the tooth

77. Which statement best compares maxillary versus mandibular impacted third molar surgery?
(A) Mandibular extractions are generally simpler due to thicker bone
(B) Maxillary impactions pose greater risk to the inferior alveolar nerve
(C) Mandibular surgery often requires more bone removal and risk of nerve involvement
(D) Maxillary teeth rarely cause sinus involvement

78. When extracting a distoangularly impacted mandibular third molar, the best initial surgical approach is to:
(A) Remove the entire tooth in one piece without sectioning
(B) Begin by removing bone from the distal aspect to expose the crown
(C) Luxate the tooth coronally from the mesial aspect
(D) Apply a cryotherapy pack before incising the flap

79. A postoperative panoramic radiograph confirms a small root fragment left behind after impacted third molar surgery. The fragment is 2 mm in length, deeply seated near the nerve canal, and the patient is asymptomatic. The recommended course of action is to:
(A) Attempt aggressive retrieval immediately
(B) Schedule the patient for hospital-based general anesthesia
(C) Leave the fragment in place, observe for potential complications
(D) Prescribe heavy analgesics and antibiotics indefinitely

80. When planning a flap for surgical removal of an impacted maxillary third molar, the key feature is to:
(A) Make a short incision without extending beyond the molar
(B) Preserve the greater palatine nerve at all costs

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(C) Include adequate anterior release to ensure visibility and prevent tension
(D) Strictly avoid using retractors in the posterior maxilla

81. In planning a frenectomy procedure for an enlarged labial frenum, which step is INCORRECT?
(A) Marking the frenal attachment extent before incision
(B) Achieving hemostasis via electrocautery or sutures
(C) Undermining the tissue to create a tension-free closure
(D) Ignoring the possibility of relapse by not addressing any pull on the gingiva

82. Which patient is more likely to require alveoloplasty after multiple extractions?
(A) A patient with a generous alveolar ridge height
(B) A patient who has minimal bony undercuts or sharp edges
(C) A patient needing a well-contoured ridge for denture fitting
(D) A patient with permanent teeth that are not replaced

83. Excessive surgical trauma during alveoloplasty can lead to:
(A) Accelerated healing and increased bone density
(B) Heightened risk of postoperative infection and bone resorption
(C) Reduced postoperative edema
(D) Immediate osseointegration of implants

84. A 60-year-old edentulous patient complains that her denture constantly irritates the alveolar ridge. Examination reveals uneven bone spicules and soft tissue ulcerations.
What is the likely procedure indicated?
(A) Biopsy of the ulcerated area only
(B) Frenectomy to reduce tension on the soft tissue
(C) Alveoloplasty to smooth the ridge
(D) Extraction of any remaining tooth fragments

85. A patient undergoes surgical removal of an impacted canine, and the surgeon notes a suspicious lesion in the follicular sac. To confirm diagnosis, the next step is:
(A) Curette out the follicle and discard it
(B) Irrigate thoroughly and suture without any further testing
(C) Perform a biopsy and send the specimen for histopathological examination
(D) Prescribe antibiotics for one week and re-evaluate

86. A small but suspicious leukoplakic patch is seen on the alveolar ridge during a routine alveoloplasty consult. The best management is to:
(A) Observe for six months without intervention
(B) Immediately apply topical steroids
(C) Perform an excisional biopsy if the lesion is easily accessible
(D) Sand it smooth with a bur and ignore it

87. When performing a biopsy of an oral soft tissue lesion, current guidelines advise:
(A) Completely cauterizing the tissue immediately to stop bleeding
(B) Injecting local anesthesia directly into the lesion
(C) Taking adequate margins to preserve lesion architecture
(D) Using dull instruments to avoid tissue fragmentation

88. During a frenectomy, the surgeon notices a non-healing ulcer on the alveolar mucosa nearby. Which suspicion should be raised immediately?
(A) Normal scarring
(B) Contact ulcer from an appliance
(C) Malignant lesion requiring biopsy
(D) Burn from a hot beverage

89. In alveolar ridge biopsy, a key sign suggesting a more serious pathology is:
(A) Soft, smooth edges of the lesion
(B) Rapid growth with rolled, indurated borders

(C) Lesion disappearing after local antibiotic treatment
(D) Uniform pink coloration resembling normal mucosa

90. Assertion: Surgical biopsy is the gold standard for diagnosing suspicious oral lesions.
Reason: Clinical appearance alone is sufficient for definitive diagnosis in most mucosal abnormalities.
(A) Both Assertion and Reason are true, and Reason is the correct explanation of Assertion.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, and Reason is true.

91. A 7-year-old presents with a high labial frenum causing a midline diastema. The best approach is typically to:
(A) Perform an immediate frenectomy
(B) Wait until permanent canines erupt and assess the space
(C) Provide a lower lingual holding arch
(D) Extract the central incisors

92. If a clinician suspects an underlying benign bony lesion while performing alveoloplasty, which imaging can confirm the lesion's margins and internal structure best?
(A) Panoramic radiograph
(B) Periapical radiograph
(C) Cone Beam Computed Tomography (CBCT)
(D) Lateral skull radiograph

93. A 45-year-old male complains of an increasing gap between his upper central incisors over six months. Examination reveals a broad labial frenum inserting at the gingival margin, along with mild gingival recession. The patient experiences difficulty brushing in the area due to the tight frenum pull.
Which procedure is indicated?
(A) Alveoloplasty to remove bone spicules
(B) Frenectomy to release the high frenal attachment
(C) Operculectomy to access the crown
(D) Immediate extraction of upper centrals

94. A 63-year-old edentulous female patient presents for evaluation. She has been experiencing persistent soreness under her upper denture for six months. On removal, there is a visible bony prominence in the premaxillary region and multiple small exostoses on the palatal aspect. The mucosa overlying these areas is ulcerated in spots. She reports difficulty chewing and frequent denture dislodgement. Radiographic assessment shows no pathology apart from thin, irregular alveolar crests. Which procedure would most likely alleviate her symptoms and improve denture fit?
(A) Simple relining of the denture
(B) Alveoloplasty to smooth the bony prominences
(C) Extraction of any residual roots
(D) Application of topical corticosteroids only

95. "Punch biopsy" refers to:
(A) Removing a lesion by incising around it with a scalpel
(B) Aspirating fluid from a suspicious swelling
(C) Using a circular blade to obtain a full-thickness sample
(D) Exfoliating surface cells with a brush

96. In an intraoral soft tissue biopsy, formalin solution is used primarily for:
(A) Local anesthesia
(B) Transport medium to maintain tissue morphology
(C) Disinfecting the patient's oral cavity
(D) Creating a hemostatic effect on the biopsy site

97. A simple excisional biopsy differs from an incisional biopsy mainly by:
(A) Removing the entire lesion and margin of normal tissue versus sampling part of it
(B) Reducing the healing time and sedation requirements
(C) Involving only superficial tissue instead of full thickness

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(D) Prioritizing malignant lesions over benign lesions

98. During a planned alveoloplasty and biopsy of a suspicious ulcer on the crest, the best timing for the biopsy is:
(A) At the start of the procedure, before bone contouring
(B) After alveoloplasty is completed and the site is sutured
(C) One week postoperatively
(D) Four weeks later to observe lesion changes

99. A 30-year-old patient is scheduled for a frenectomy to resolve excessive gingival pulling. Which postoperative instruction helps ensure proper healing and stability?
(A) Avoid speaking for two weeks
(B) Perform gentle stretching exercises after initial healing
(C) Chew only on the surgical site
(D) Apply ice packs continuously for 72 hours

100. When performing a soft tissue biopsy in the alveolar ridge region, the key action to avoid specimen distortion is:
(A) Grasping the tissue forcefully with artery forceps
(B) Injecting anesthetic directly into the lesion
(C) Using minimal traction and placing the anesthetic around the lesion
(D) Freezing the tissue with ice prior to cutting

101. "Greenstick fracture" in the context of maxillofacial trauma is best defined as:
(A) A complete fracture with multiple bony fragments
(B) A fracture that extends into the temporomandibular joint space
(C) A partial fracture in which one cortex is broken and the other is bent
(D) A fracture that involves the alveolar process only

102. In facial trauma, the "Le Fort I" fracture classically involves:
(A) The arch of the zygoma
(B) A horizontal fracture above the level of the nasal fossa, separating the maxilla from the pterygoid plates and nasal septum
(C) The nasofrontal suture extending through the orbits
(D) A fracture through the condylar region of the mandible

103. Why do pediatric mandibular fractures often heal more quickly compared to adult fractures?
(A) Thicker cortical bone in children
(B) Minimal vascular supply in children's jaws
(C) Enhanced bone remodeling capacity and abundant blood supply in growing children
(D) Reduced masticatory muscle strength in children

104. Which of the following clinical findings is NOT typically associated with a mandibular fracture?
(A) Step deformity along the lower border of the mandible
(B) Altered occlusion
(C) Deviation of the mandible on opening
(D) Decreased tear production

105. Compared to closed reduction, open reduction and internal fixation (ORIF) of mandibular fractures generally:
(A) Requires no incision
(B) Has a longer immobilization period
(C) Provides immediate stabilization with rigid fixation
(D) Is performed without general anesthesia

106. A patient with a suspected midfacial fracture presents with bilateral periorbital ecchymosis ("raccoon eyes") and subconjunctival hemorrhage. Which fracture classification is most likely?
(A) Le Fort I
(B) Le Fort II
(C) Mandibular angle fracture
(D) Zygomatic arch fracture

107. Following a fall, a patient presents with significant swelling in the left mandibular body region and malocclusion. Panoramic radiograph suggests a fracture line. Before finalizing treatment, you should:
(A) Immediately place an arch bar without further imaging
(B) Obtain a Cone Beam CT or CT scan for three-dimensional assessment
(C) Prescribe antibiotics only and observe for two weeks
(D) Attempt reduction in the clinic without anesthesia

108. A patient with a suspected zygomatic complex fracture complains of diplopia (double vision). The most appropriate initial management step is:
(A) Perform forced duction testing and evaluate extraocular muscle entrapment
(B) Immediately place intermaxillary fixation
(C) Inject local anesthesia and attempt closed reduction
(D) Prescribe analgesics and ask the patient to return if the diplopia worsens

109. In evaluating a mandibular fracture, a key diagnostic action is to:
(A) Check only for tooth mobility
(B) Record occlusal discrepancies and mandibular range of motion
(C) Palpate the nasofrontal suture
(D) Inspect the uvula for deviation

110. In the acute management of a facial laceration extending into the lip vermilion border, which action is INCORRECT?
(A) Meticulous approximation of the vermilion border
(B) Debriding any necrotic or contaminated tissue
(C) Using a wide, approximate alignment for faster closure
(D) Checking for intraoral component requiring layered suturing

111. Which factor increases the likelihood of nonunion in mandibular fractures?
(A) Early, stable fixation with plates
(B) Good nutritional status
(C) Patient compliance with postoperative instructions
(D) Inadequate immobilization and persistent motion at the fracture site

112. Excessive edema in a midfacial fracture can lead to:
(A) Immediate bone healing
(B) Decreased risk of airway obstruction
(C) Potential compromise of the airway via pharyngeal or sublingual space
(D) Reduced need for surgical intervention

113. A 23-year-old motorcyclist with no helmet sustains facial trauma. He presents with massive bruising across the midface, epistaxis, and mobility of the maxilla on palpation.
Which fracture type is most likely?
(A) Le Fort I
(B) Le Fort III
(C) Mandibular symphysis fracture
(D) Zygomatic arch fracture

114. A patient arrives with a fractured mandible and reports numbness in the lower lip and chin area. This symptom suggests involvement of which anatomical landmark?
(A) Inferior alveolar nerve near the mental foramen
(B) Buccal nerve near the retromolar pad
(C) Lingual nerve in the molar region
(D) Facial nerve branches near the angle of the mandible

115. An elderly patient sustains a fractured mandible at the angle, with a grossly carious third molar at the fracture site. Management typically includes:
(A) Leaving the third molar untouched in all cases
(B) Extracting the third molar if it is diseased or contributing to infection risk

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(C) Immediate block graft placement without addressing the tooth
(D) Simple observation with antibiotic mouthwash

116. According to standard trauma guidelines, initial care for suspected facial fracture with airway compromise should prioritize:
(A) Immediate reduction of the fracture
(B) Securing the airway and controlling hemorrhage
(C) Antibiotic prophylaxis
(D) Panoramic radiography first

117. Following blunt trauma to the jaw, a patient complains of persistent ear pain and limited mouth opening. A "red flag" differential diagnosis includes:
(A) Simple TMJ contusion
(B) Fracture of the condylar head
(C) Unrelated middle ear infection
(D) Minor muscle spasm from bruxism

118. In zygomatic complex fractures, infraorbital nerve paresthesia commonly manifests as:
(A) Numbness over the ear
(B) Numbness of the mid-forehead region
(C) Numbness in the cheek, upper lip, and side of the nose
(D) Numbness in the lower lip

119. Assertion: Maxillomandibular fixation (MMF) is used in managing jaw fractures.
Reason: MMF ensures immediate postoperative airway security.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, and Reason is true.

120. After open reduction and internal fixation of a mandibular fracture, the patient should be instructed to:
(A) Chew tough foods immediately for stress testing the hardware
(B) Maintain rigid intermaxillary fixation for six months
(C) Adhere to soft or semi-solid diet as advised and maintain meticulous oral hygiene
(D) Avoid any cleaning near the surgical site

121. When evaluating an orbital blowout fracture, the imaging of choice to assess orbital floor disruption and muscle entrapment is:
(A) Lateral skull radiograph
(B) Panoramic radiograph
(C) CT scan of the orbits
(D) Mandibular occlusal radiograph

122. A 36-year-old woman sustains a sports-related facial injury, presenting with numbness over her right cheek, epistaxis, and a mobile maxilla on palpation. She experiences difficulty breathing through her nose due to swelling. Radiographs and CT suggest a pyramidal midface fracture pattern.
What is the fracture classification and key concern?
(A) Le Fort II fracture; airway patency and sinus involvement
(B) Le Fort I fracture; alveolar ridge height
(C) Zygomatic arch fracture; malocclusion
(D) Le Fort III fracture; scalp lacerations

123. A 60-year-old patient with osteoporosis falls onto her chin. She now has pain and swelling near the mandibular symphysis, with difficulty in approximating her anterior teeth. She is on bisphosphonate therapy for osteoporosis. Radiographs show a displaced fracture.
Which factor requires special attention in management?
(A) Overlooking the patient's bisphosphonate status
(B) Early mobilization of the jaw without fixation
(C) Potential risk of osteonecrosis at the fracture site
(D) Simple observation until it heals spontaneously

124. "Ecchymosis in the floor of the mouth" indicating possible mandibular fracture is known as:
(A) Raccoon sign
(B) Battle sign
(C) Panda sign
(D) Sublingual hematoma

125. In the classification of zygomatic fractures, the term "tripod fracture" refers to disruption at the:
(A) Zygomaticofrontal, zygomaticotemporal, and zygomaticomaxillary sutures
(B) Orbital apex, nasal septum, and pterygoid plates
(C) Mandibular condyle, coronoid process, and symphysis
(D) Orbit, nasal bone, and frontal bone

126. Basic Life Support (BLS) is best defined as:
(A) Advanced airway management with endotracheal intubation
(B) Pharmacological intervention to stabilize arrhythmias
(C) Maintenance of airway, breathing, and circulation without sophisticated equipment
(D) Administration of intravenous fluids and vasopressors

127. Which medication is the first-line treatment for acute anaphylaxis in an oral surgery setting?
(A) Epinephrine (adrenaline)
(B) Diphenhydramine (antihistamine)
(C) Hydrocortisone
(D) Oxygen inhalation

128. Why is it important for an oral surgeon to recognize the signs of hypoglycemia in diabetic patients?
(A) Hypoglycemia rarely poses a risk in dental practice
(B) Low blood sugar can lead to rapid deterioration of consciousness and seizures
(C) Hypoglycemia only affects wound healing, not cognition
(D) Hyperglycemia is more life-threatening than hypoglycemia

129. Which of the following is NOT a recommended step in managing a conscious patient who exhibits mild to moderate hypoglycemia during oral surgery?
(A) Stop the procedure and check blood glucose
(B) Provide a fast-acting carbohydrate source, such as glucose gel
(C) Administer sublingual nitroglycerin
(D) Reassess vital signs and ensure the patient is stable

130. In comparing syncope (fainting) with a generalized epileptic seizure, which statement is accurate?
(A) Syncope typically results in prolonged postictal confusion
(B) Epileptic seizures have minimal muscle contractions, while syncope has tonic-clonic movements
(C) Syncope often presents with a brief loss of consciousness without prolonged convulsions
(D) Patients with a seizure seldom exhibit tongue biting or incontinence

131. A patient develops chest pain and shortness of breath mid-procedure, with suspicion of angina. The most appropriate immediate action is:
(A) Continue the procedure to distract the patient
(B) Place the patient supine and administer intravenous fluids
(C) Sit the patient upright and administer sublingual nitroglycerin
(D) Administer intramuscular epinephrine

132. A patient under local anesthesia with adrenaline begins experiencing palpitations, tremors, and anxiety. Which immediate measure could help distinguish an anesthetic-related adrenaline surge from an acute panic attack?
(A) Blood glucose measurement
(B) Checking the patient's pulse rate and blood pressure
(C) Administering sublingual nitroglycerin
(D) Immediate injection of benzodiazepine

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133. During a tooth extraction, a patient suddenly exhibits signs of airway obstruction—grabbing their throat, unable to speak or cough effectively. The first step is to:
(A) Obtain a chest radiograph
(B) Perform back blows and abdominal thrusts (Heimlich maneuver) if complete obstruction is suspected
(C) Attempt to pass a nasogastric tube
(D) Administer oxygen via nasal cannula

134. In managing a syncopal episode in the dental chair, the key immediate action is:
(A) Forcing the patient into a standing position
(B) Reclining the chair to a supine position with legs elevated
(C) Spraying cold water on the patient's face
(D) Administering intravenous dextrose

135. For a patient with asthma who experiences mild bronchospasm during a minor procedure, which management step is INCORRECT?
(A) Stop the procedure and remove any obvious irritants
(B) Encourage the patient to use their short-acting bronchodilator
(C) Position the patient upright for easier breathing
(D) Administer subcutaneous insulin

136. During sedation in the dental office, which factor most increases the likelihood of airway obstruction?
(A) Patient in a semi-supine position with head supported
(B) Use of a throat pack
(C) Decreased muscle tone and over-sedation leading to tongue collapse
(D) Light sedation with the patient responding to verbal commands

137. Excessive hemorrhage following tooth extraction in a patient on warfarin is commonly due to:
(A) Low INR levels
(B) Uncontrolled platelet aggregation
(C) Impaired coagulation factor synthesis leading to prolonged bleeding
(D) Thrombocytosis causing microhemorrhages

138. A 50-year-old known hypertensive patient suddenly loses consciousness in the waiting area. Bystanders report snoring-like respirations. Blood pressure is unrecordable, pulse is weak.
What is the immediate priority?
(A) Administer sublingual nitroglycerin
(B) Begin chest compressions if pulse is absent and call emergency services
(C) Place the patient upright
(D) Attempt to give oral glucose

139. A patient experiences acute onset of high fever, muscle rigidity (especially in the jaw), and tachycardia during IV sedation with a triggering agent. Which life-threatening emergency is suspected?
(A) Serotonin syndrome
(B) Malignant hyperthermia
(C) Addisonian crisis
(D) Thyroid storm

140. If a patient with a known history of severe penicillin allergy develops anaphylaxis during a dental procedure, besides epinephrine, the next best medication to administer acutely is:
(A) Intravenous acetaminophen
(B) Intramuscular hydrocortisone
(C) Intravenous diphenhydramine (or another H1 antihistamine)
(D) Oral antibiotics

141. According to guidelines, what is the recommended storage and checking practice for emergency drugs in a dental office?
(A) Store them in a locked safe without labeling
(B) Keep them in a designated emergency kit, regularly check expiration dates, and ensure easy access
(C) Only maintain oxygen and adrenaline; other medications are optional
(D) Replace all drugs every five years regardless of expiration date

142. A patient under local anesthesia becomes confused, with slurred speech and a metallic taste, suggesting possible:
(A) Syncope
(B) Local anesthetic toxicity (intravascular injection)
(C) Migraine aura
(D) Simple sedation effect

143. Rapid breathing, tingling in the hands or around the mouth, and lightheadedness during a stressful dental procedure often indicates:
(A) Hyperventilation syndrome
(B) Hypovolemic shock
(C) Airway obstruction
(D) Malignant hyperthermia

144. Assertion: Oxygen supplementation is indicated for most dental emergencies.
Reason: Increased oxygen intake helps reduce the respiratory drive in COPD patients.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, and Reason is true.

145. In a diabetic patient experiencing hypoglycemia, who becomes unconscious and cannot take oral carbohydrates, the recommended emergency treatment is:
(A) Oral glucose tablets
(B) Intravenous 50% dextrose or intramuscular glucagon
(C) Oral fruit juice
(D) Subcutaneous short-acting insulin

146. If a patient experiences suspected LA (local anesthetic) toxicity, which investigation most reliably confirms systemic involvement?
(A) Serum electrolyte test
(B) Pulse oximetry reading
(C) Electrocardiogram (ECG)
(D) Serum lidocaine (or anesthetic) concentration level

147. A 58-year-old patient with stable angina begins complaining of chest tightness and lightheadedness during a complex molar extraction. He is conscious but diaphoretic. Blood pressure is 90/60 mmHg, and pulse is 100/min. He denies known allergy.
Which immediate interventions are appropriate to relieve symptoms and ensure safety?
(A) Lay supine and inject epinephrine
(B) Sit upright, administer sublingual nitroglycerin, and provide supplemental oxygen
(C) Force the mouth open, continue extraction quickly
(D) Restrict fluids and give insulin

148. A 70-year-old with a history of chronic obstructive pulmonary disease (COPD) arrives for tooth extraction. He uses home oxygen intermittently. During local anesthesia, he becomes cyanotic, short of breath, and cannot tolerate lying back. His respiratory rate is 32/min.
What is the safest immediate action?
(A) Complete the extraction quickly
(B) Administer high-flow oxygen by face mask
(C) Adjust chair to an upright position and provide controlled low-flow oxygen
(D) Encourage hyperventilation to lower CO_2

149. "Epinephrine reversal" in a hypertensive patient on alpha-blockers refers to:
(A) An exaggerated hypertensive response to adrenaline
(B) Unopposed beta-2 vasodilation causing hypotension
(C) Sudden cessation of epinephrine's effect
(D) Tachyphylaxis rendering epinephrine useless

150. For a patient with severe bleeding post-tooth extraction, which local hemostatic agent might be placed directly into the socket?
(A) Adrenaline (systemic injection)
(B) Oxidized regenerated cellulose (e.g., Surgicel)
(C) Sublingual benzodiazepine
(D) Topical fluoride gel

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151. In dentistry, “Preprosthetic Surgery” refers to:
(A) The extraction of all remaining teeth for immediate denture fabrication
(B) Surgical procedures performed to prepare the mouth for a prosthesis, improving tissue form and function
(C) Placing implants into the jaw for complete edentulism without prior assessment
(D) The purely cosmetic reshaping of lips and cheeks

152. “Alveolar ridge augmentation” is commonly achieved using:
(A) Gold foil fillings
(B) Gutta-percha points
(C) Bone graft materials or bone substitutes
(D) Fluoride gel applications

153. Why is it important to evaluate the interarch space before implant surgery?
(A) To ensure the implant fixture is aesthetically hidden by the cheek
(B) To confirm there is adequate vertical dimension for the prosthetic components
(C) To reduce local anesthetic use
(D) To determine if the alveolar ridge is vascularized

154. Which of these factors is NOT an absolute contraindication for implant placement?
(A) Active, uncontrolled periodontal disease
(B) Severe, uncontrolled diabetes
(C) Adequate bone height and width
(D) Ongoing bisphosphonate-related osteonecrosis of the jaw

155. Compared to removable dentures, implant-supported prostheses generally:
(A) Demand no bone support
(B) Offer improved masticatory efficiency and stability
(C) Require no surgery
(D) Are always less expensive

156. When planning a preprosthetic alveoloplasty, which key principle guides the extent of bone removal?
(A) Remove as much bone as possible to prevent future bony irregularities
(B) Preserve adequate ridge height and contour for prosthesis support
(C) Always flatten the ridge to the mandibular canal level
(D) Strip the periosteum completely for better healing

157. A patient with moderately resorbed ridges needs alveolar augmentation before receiving complete dentures. Which grafting method often yields the highest success rate in alveolar ridge reconstruction?
(A) Autogenous block graft harvested from the patient’s own chin or ramus
(B) Use of silver amalgam mixed with hydroxyapatite
(C) Placement of a gutta-percha graft in alveolar defects
(D) Injection of platelet-rich plasma alone without a scaffold

158. Following implant placement in the anterior maxilla, the patient reports minor wound dehiscence exposing the implant cover screw. The soft tissue is otherwise healthy and non-infected. The best next step is:
(A) Immediate removal of the implant
(B) Perform an aggressive second-stage surgery
(C) Place a small collagen membrane or suture to achieve primary closure
(D) Prescribe systemic antifungals

159. In planning implant placement, a key action is to assess:
(A) The color of adjacent restorations only
(B) The thickness of existing soft tissue and keratinized gingiva
(C) Whether the patient can fully open their mouth to 10 mm
(D) Age above 80 automatically disqualifies for implants

160. Which step is INCORRECT when raising a flap for alveoloplasty in preprosthetic surgery?
(A) Making adequate releasing incisions for visibility
(B) Preserving vascular pedicles to maintain flap viability
(C) Stripping the periosteum completely to ensure minimal bleeding
(D) Checking flap tension to avoid necrosis

161. Smokers undergoing implant placement have a:
(A) Significantly lower chance of implant failure compared to non-smokers
(B) Similar success rate to non-smokers
(C) Slightly higher risk of implant failure
(D) Significantly higher risk of implant failure

162. Excessive forceful seating of an implant into dense bone can lead to:
(A) Immediate bone regeneration and faster osseointegration
(B) Thermal injury and compression necrosis around the implant site
(C) A decreased need for irrigation during osteotomy
(D) Guaranteed primary stability without complications

163. A 65-year-old patient has a narrow alveolar ridge in the anterior mandible, severely resorbed. He desires implant-supported overdentures. Radiographs reveal just 2–3 mm of bone width. Which procedure is indicated?
(A) Placement of short implants without modification
(B) Alveoloplasty to reduce the ridge further
(C) Ridge splitting or bone grafting prior to implant insertion
(D) Fabrication of a removable partial denture

164. After a sinus lift procedure for implant placement in the upper jaw, a patient reports a communication between the sinus and mouth. Which immediate diagnostic test is helpful?
(A) Transillumination of the sinus
(B) Ask the patient to blow their nose gently while pinching the nostrils
(C) Valsalva test, observing for air bubbles or fluid passage through the socket
(D) MRI of the temporomandibular joint

165. A patient presents with a painful implant site three weeks after surgery, showing suppuration and peri-implant radiolucency. The implant is slightly mobile. The most appropriate management is:
(A) Dismiss the patient with an antibiotic mouthrinse
(B) Remove the implant, debride the area, and consider future re-implantation once healed
(C) Tighten the implant further to achieve better stability
(D) Place a splint to immobilize the implant

166. According to standard implant dentistry protocols, which statement is correct regarding immediate loading?
(A) Immediate loading applies to all implant sites without exception
(B) It requires high initial stability and favorable occlusal conditions
(C) It eliminates the need for bone healing
(D) It is only recommended in patients over 70 years of age

167. A patient complains of persistent dull ache around a dental implant placed six months ago, with occasional purulent discharge. Radiographs show vertical bone loss. Which red-flag condition should be ruled out first?
(A) Normal bone remodeling
(B) Local allergic reaction to the implant metal
(C) Peri-implantitis
(D) Residual chronic sinusitis

168. In alveolar bone grafting for preprosthetic purposes, a key sign of successful graft incorporation is:
(A) Persistent graft mobility after 3–4 months
(B) Radiographic evidence of graft resorption
(C) Stable graft volume with trabecular continuity on imaging
(D) Swelling and sinus tract formation

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169. Assertion: Subperiosteal implants are rarely placed nowadays.
Reason: They are technique-sensitive and pose higher risks of infection and peri-implant bone loss compared to endosseous implants.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, and Reason is true.

170. A patient with limited keratinized tissue around an implant complains of soreness when brushing. What is a recommended surgical management?
(A) Discontinue brushing and rely on mouthwash
(B) Coronally positioned flap or free gingival graft to increase keratinized gingiva
(C) Remove the implant
(D) Place a subperiosteal implant around the fixture

171. Prior to ridge augmentation with bone grafts, which imaging modality best evaluates ridge height and width in three dimensions?
(A) Periapical radiograph
(B) Panoramic radiograph
(C) Cone Beam Computed Tomography (CBCT)
(D) Lateral skull radiograph

172. A 72-year-old patient with a history of osteoporosis wants implant-supported dentures. She has minimal alveolar bone height in the posterior mandible due to extensive resorption.
Which alternative implant option is viable?
(A) Short implants placed in severely resorbed bone
(B) Zygomatic implants in the mandible
(C) Ramus blade implant without bone grafting
(D) Transosteal (mandibular staple) implant, crossing the inferior border

173. A 60-year-old edentulous female with well-controlled diabetes seeks implant-supported maxillary overdentures. Examination reveals moderate alveolar bone resorption. Her physician confirms stable HbA1c of 7%. She reports occasional smoking (5 cigarettes/day).
Given her profile, which initial implant treatment approach is most suitable to balance success and risk?
(A) Immediate loading of four implants without grafting
(B) Delaying implant placement for indefinite smoking cessation
(C) Placing standard implants with careful surgical technique, possible staged loading
(D) Zygomatic implants in all quadrants

174. A 55-year-old male presents post-cancer resection of the lateral mandible, leaving a continuity defect. He desires future implant-retained prosthetics. There is minimal residual alveolar bone. He has no active malignancy.
Which reconstructive method could facilitate subsequent implant placement?
(A) Free fibula flap reconstruction of the mandible
(B) Simple soft tissue graft over the defect
(C) Placement of extra-short implants in the remaining bone
(D) Use of a gold mesh only

175. A “stent” in preprosthetic and implant surgery is:
(A) A flexible wire to measure alveolar crest thickness
(B) A surgical guide used to position implant drills and indicate desired prosthetic tooth location
(C) A device placed in the sinus to prevent mucosal collapse
(D) A container to store bone graft materials intraoperatively

176. Which instrument is commonly used for bone condensing or expansion in narrow ridges?
(A) Bone condenser or osteotome
(B) Orthodontic band pusher
(C) Periodontal scaler
(D) Gutta-percha spreader

177. In implant prosthetics, why is a two-stage surgical approach sometimes used?
(A) To avoid using local anesthesia
(B) To ensure immediate loading on the implant
(C) To allow submerged healing and osseointegration before abutment placement
(D) To reduce the cost of the procedure

178. Which of the following is NOT typically a recognized advantage of implant-supported overdentures?
(A) Improved phonetics
(B) Reduced alveolar bone resorption
(C) Less stable chewing surfaces than conventional dentures
(D) Enhanced patient satisfaction and confidence

179. Compared to onlay bone grafts, interpositional bone grafts for vertical ridge augmentation:
(A) Are placed on the outer cortical plate
(B) Sit between bony segments to increase height
(C) Do not require any surgical approach to the ridge
(D) Are exclusively used for horizontal expansion

180. A patient complains of clicking and instability with a maxillary implant-supported overdenture. The best immediate solution is to:
(A) Remove all implants and switch to a conventional denture
(B) Adjust or replace the attachment components for a tighter fit
(C) Send the patient for a CT scan with no clinical modification
(D) Extract opposing natural teeth

181. After sinus augmentation (sinus lift) for implant placement, the patient must be advised to:
(A) Vigorously blow the nose to clear any blood clots
(B) Use straws for suction during the first week
(C) Sneeze with the mouth open to reduce sinus pressure
(D) Skip all antibiotics to avoid drug interactions

182. During a ridge expansion procedure with osteotomes, the operator notes a fracture line in the buccal cortical plate. The best immediate management is:
(A) Continue expanding with more force
(B) Place a rigid membrane or stabilization method to support the fracture
(C) Abort the procedure entirely and place a removable prosthesis
(D) Seal the fracture with restorative composite

183. In diagnosing peri-implantitis, a key feature to assess clinically is:
(A) Crown color mismatch
(B) Lack of a gingival sulcus
(C) Probing depths around the implant and bleeding on probing
(D) Occlusal contact only on the mesial side

184. Which action is INCORRECT after suturing a bone graft for preprosthetic augmentation?
(A) Placing a non-compressive dressing to protect the site
(B) Instructing the patient on gentle rinsing
(C) Advising smoking cessation
(D) Encouraging vigorous brushing directly over the sutured area immediately

185. In patients with uncontrolled diabetes, the likelihood of implant failure is:
(A) Unchanged from healthy individuals
(B) Slightly decreased
(C) Significantly increased
(D) Zero, as implants are contraindicated

186. Excessive cantilever forces on an implant-supported fixed bridge commonly cause:
(A) Enhanced bone density
(B) Marginal tissue thickening
(C) Loosening of abutment screws and possible crestal bone loss
(D) Permanent anesthesia in the mental nerve distribution

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187. A 40-year-old presents complaining that her implant crown "feels loose." Examination reveals the crown is mobile, but the implant fixture is stable when tested with a mirror handle.
What is the most likely cause?
(A) Implant fracture
(B) Abutment screw loosening
(C) Peri-implant bone loss
(D) Soft-tissue hyperplasia

188. A patient exhibits radiographic gaps around an implant placed two months ago, with no signs of infection but a clear lack of bone contact on one side. The implant is clinically stable. This might indicate:
(A) Osseointegration failure requiring immediate removal
(B) Normal early healing with partial gap fill still pending
(C) A fractured implant apex
(D) Excessive alveolar ridge remodeling that demands urgent augmentation

189. In a patient needing a full-arch mandibular reconstruction with limited bone, the decision to perform alveolar distraction osteogenesis versus block grafting depends primarily on:
(A) Surgeon's preference for sedation type
(B) The patient's melanin pigmentation
(C) The volume of bone needed and soft-tissue expansion requirements
(D) A desire to avoid any orthodontic involvement

190. According to standard guidelines, implants placed immediately after tooth extraction (immediate implant placement) require:
(A) No alveolar bone around the implant threads
(B) Meticulous debridement of the socket and an intact bony wall
(C) No antibiotic coverage
(D) Insertion into a completely healed ridge only

191. After an alveolar graft, a patient develops persistent swelling, erythema, and foul odor near the graft site. Which red-flag condition should be suspected?
(A) Normal postoperative edema
(B) Graft osseointegration
(C) Graft infection or failure
(D) Soft tissue graft take

192. In preprosthetic correction of a prominent maxillary torus, a key symptom prompting surgical removal is:
(A) Minimal speech interference
(B) Complete comfort under existing dentures
(C) Ulceration and repeated trauma from the prosthesis
(D) Stable torus with no size changes for 10 years

193. Assertion: Implants placed in the posterior maxilla often have lower success rates compared to the anterior mandible.
Reason: The posterior maxilla can exhibit poorer bone quality and reduced density, making osseointegration more challenging.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, and Reason is true.

194. For a large soft tissue undercut on the buccal side of an edentulous ridge that prevents proper denture seating, the recommended surgical management is:
(A) Electrocautery of the mucosa only
(B) Buccal sulcus deepening without removing any fibrous tissue
(C) Reduction of the undercut via fibrous tissue excision or relocation, possibly with mucosal graft
(D) Extraction of all residual alveolar bone

195. Before placing implants in a patient with a history of sinus surgery, which additional investigation helps assess sinus health and patency?

(A) Lateral cephalogram
(B) Water's (occipitomental) view or CT scan of the sinuses
(C) Bitewing radiograph
(D) Panoramic view focusing solely on the mandible

196. A 68-year-old edentulous male with a moderately resorbed alveolar ridge in the maxilla has been recommended two-stage implant placement. He is anxious about the waiting period between surgeries. Radiographs confirm adequate bone height.
Which reasoning best justifies a two-stage approach for this patient?
(A) To avoid local anesthesia during the first surgery
(B) Ensuring uninterrupted healing and stronger osseointegration prior to abutment placement
(C) Minimizing the cost of the prosthesis
(D) Speeding up the overall treatment

197. A 70-year-old woman with well-controlled hypertension and osteoporosis has undergone a ridge augmentation using a combination of autogenous ramus graft and xenograft in the anterior maxilla. She requires 4 implants for a full-arch prosthesis.
What postoperative care is crucial?
(A) Immediate heavy chewing on the grafted area
(B) Smoking to promote blood flow
(C) Antibiotic coverage and limited mechanical stress on the graft site
(D) Complete withholding of any analgesics

198. "Immediate loading" in implant dentistry is defined as:
(A) Placement of an implant and waiting at least six months before loading
(B) Loading the implant with a functional provisional or final prosthesis within one week of placement
(C) Never placing a prosthesis on the implant
(D) Using a healing abutment but avoiding any occlusal contacts for 12 months

199. Which surgical handpiece setting is typically recommended during implant site preparation to prevent thermal damage?
(A) Low speed (around 800–1200 rpm) with copious irrigation
(B) High speed (over 200,000 rpm) without irrigation
(C) Minimal torque and no irrigation
(D) Reverse rotation at high speed

200. In preprosthetic implant planning, "emergence profile" refers to:
(A) The color match between the implant crown and adjacent teeth
(B) The shape and contour at which the prosthetic crown emerges from the soft tissue
(C) The recommended healing time before loading
(D) The antibiotic regimen for the first week

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CHAPTER 04

PEDODONTICS

1. What is the most appropriate definition of "growth" in the context of pediatric dentistry?
   (A) A continuous increase in functional capacity of tissues without any numerical change in cell count
   (B) An increase in the structural size and mass of the body or its parts
   (C) A progressive adaptation of behavior and function over time
   (D) A temporary change in cell structure that reverses after adolescence

2. Which developmental stage in tooth formation is primarily characterized by the initial budding of the dental lamina into tooth buds?
   (A) Bud stage
   (B) Cap stage
   (C) Bell stage
   (D) Apposition stage

3. In pediatric dentistry, how does "development" specifically differ from "growth"?
   (A) It involves only physical changes
   (B) It reflects both qualitative and quantitative refinements in function
   (C) It focuses exclusively on the increase in number and size of cells
   (D) It manifests as random biological alterations without a predictable sequence

4. Which one of the following is NOT a recognized factor influencing the timing of primary tooth eruption?
   (A) Nutritional status
   (B) Genetic predisposition
   (C) Socioeconomic status
   (D) Endocrine function

5. Which statement best differentiates primary teeth from permanent teeth regarding enamel thickness?
   (A) Primary teeth have thicker enamel compared to permanent teeth
   (B) Primary teeth have thinner enamel compared to permanent teeth
   (C) Both primary and permanent teeth have the same enamel thickness
   (D) Primary teeth have varying enamel thickness that exceeds permanent teeth in molars only

6. During mixed dentition, the first permanent tooth to erupt in most children is:
   (A) Maxillary central incisor
   (B) Mandibular lateral incisor
   (C) Mandibular first molar
   (D) Maxillary first molar

7. A 7-year-old patient presents with early exfoliation of primary maxillary incisors. Which underlying condition might BEST explain accelerated primary tooth loss?
   (A) Hypothyroidism
   (B) Hyperthyroidism
   (C) Juvenile diabetes mellitus
   (D) Vitamin D-resistant rickets

8. If a child is delayed in the eruption of primary teeth beyond normal limits, which of the following is the BEST immediate step in management?
   (A) Immediate surgical exposure of unerupted teeth
   (B) Panoramic radiographic evaluation
   (C) Extraction of any primary tooth that has partially erupted
   (D) Referral to an endocrinologist without imaging

9. Which feature is MOST characteristic of the bell stage of tooth development?
(A) Formation of a tooth bud
(B) Differentiation of ameloblasts and odontoblasts
(C) Initiation of root formation
(D) Resorption of dental lamina

10. In normal tooth eruption sequences, which of the following statements is INCORRECT?
(A) Maxillary central incisors erupt before maxillary lateral incisors
(B) Mandibular central incisors typically erupt before maxillary central incisors
(C) The maxillary canines erupt before the premolars
(D) The mandibular first permanent molar is often the first permanent tooth to appear

11. Which primary tooth is MOST likely to be the first to exfoliate in an average child?
(A) Mandibular central incisor
(B) Maxillary central incisor
(C) Mandibular lateral incisor
(D) Maxillary lateral incisor

12. Delayed shedding of primary teeth can result in which of the following most likely consequences?
(A) Increased risk of traumatic injury to adjacent permanent teeth
(B) Anterior crossbite with permanent incisors
(C) Shift in the midline of the dental arch
(D) Self-correction of crowding without intervention

13. A 10-year-old complains of crowding in the lower anterior region. Examination shows retained primary incisors with their permanent successors erupting lingually. What is the probable diagnosis?
(A) Transposition
(B) Ectopic eruption
(C) Lingual eruption
(D) Early exfoliation

14. A child presents with multiple supernumerary teeth identified radiographically near the maxillary anterior region, delaying eruption of permanent incisors. Which condition should be MOST suspected?
(A) Cleidocranial dysplasia
(B) Amelogenesis imperfecta
(C) Dentinogenesis imperfecta
(D) Ectodermal dysplasia

15. In children with delayed permanent tooth eruption due to supernumerary teeth, what is the BEST first line of management?
(A) Extraction of the supernumerary teeth
(B) Placement of a space maintainer without extraction
(C) Full orthodontic treatment immediately
(D) Observe until the child is 14 years old

16. According to standard pediatric dentistry guidelines, at what approximate age should a child's first dental visit be scheduled?
(A) By 3 years of age
(B) Immediately after the first permanent tooth appears
(C) Within 6 months of the eruption of the first primary tooth or by 1 year of age
(D) Only when symptoms, such as pain, first arise

17. A 5-year-old shows no radiographic evidence of any developing permanent tooth buds. Which condition is MOST likely to be suspected?
(A) Supernumerary teeth
(B) Anodontia
(C) Gemination
(D) Dens in dente

18. Which key sign characterizes Early Childhood Caries (ECC)?
(A) A single pit lesion in a primary molar in a 6-year-old
(B) Carious lesions on the smooth surfaces of anterior primary teeth in a child under 6
(C) Mild staining of interproximal surfaces in a 9-year-old

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(D) White spot lesions restricted to permanent teeth only

19. Assertion: Early Childhood Caries often begins on the maxillary anterior teeth.
Reason: Frequent and prolonged exposure to sugary liquids can pool around the maxillary anterior region.
(A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.
(B) Both Assertion and Reason are true, but the Reason is NOT the correct explanation of the Assertion.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

20. Which of the following is the MOST appropriate method to prevent Early Childhood Caries?
(A) Allowing a child to sleep with a bottle of juice
(B) Initiating regular bottle feeding until age 4
(C) Early weaning from the bottle and encouraging a cup by 12 months
(D) Putting sugar in pacifiers to soothe the child

21. To assess caries risk in a 3-year-old with suspected ECC, which diagnostic step is MOST informative?
(A) Orthopantomogram (OPG)
(B) Bitewing radiographs of posterior teeth
(C) Testing for salivary pH
(D) Full mouth periapical radiographs

22. A 4-year-old child with frequent snacking habits presents with enamel caries on several primary molars. Parents ask for advice on sugar intake. Which recommendation is MOST appropriate?
(A) Snack freely on candies
(B) Restrict sugary snacks to mealtimes
(C) Provide unlimited fruit juices
(D) Encourage snacking every hour

23. A 5-year-old child with widespread demineralization on anterior primary teeth is brought in by parents who report the child sleeps with a bottle of sweetened milk. On examination, multiple smooth surface lesions are noted. Which term BEST describes this clinical presentation?
(A) Rampant caries
(B) Occult caries
(C) Arrested caries
(D) Pit and fissure caries

24. A 6-year-old child presents with a history of using a non-fluoridated community water supply. Clinical exam reveals white spot lesions on maxillary incisors. Radiographs confirm incipient interproximal caries. Which preventive intervention is MOST beneficial initially?
(A) Amalgam restorations
(B) Fluoride varnish application
(C) Full coverage stainless steel crowns
(D) Immediate extraction of affected teeth

25. A 7-year-old, under regular dental check-ups, arrives with new onset interproximal cavities in the primary molars despite meticulous oral hygiene practices. Parents confirm adherence to recommended brushing techniques, limited snacking, and routine use of a fluoride toothpaste. Radiographs reveal moderate enamel involvement in proximal areas. The child's diet is balanced, but local water analysis shows negligible fluoride levels. Which measure is MOST appropriate to bolster caries prevention and manage these early lesions?
(A) Sealants only
(B) Topical fluoride gel application
(C) Systemic fluoride supplements
(D) Dental extraction of affected molars

26. Which of the following best describes the mechanism by which fluoride prevents dental caries?
(A) Strictly creating a mechanical barrier on the tooth surface
(B) Converting tooth enamel into a purely inorganic matrix

(C) Enhancing remineralization and reducing demineralization of enamel
(D) Replacing essential tooth minerals with synthetic compounds

27. Which concentration of fluoride in community water is generally recommended to prevent caries in temperate climates?
(A) 0.1 ppm
(B) 0.7 ppm
(C) 1.5 ppm
(D) 2.5 ppm

28. How does systemic fluoride differ from topical fluoride in preventing dental caries?
(A) Systemic fluoride is applied on fully erupted teeth only
(B) Topical fluoride aids pre-eruptive tooth formation, while systemic fluoride remineralizes enamel surfaces
(C) Systemic fluoride incorporates into developing teeth, whereas topical fluoride acts externally on erupted surfaces
(D) They have no distinguishable mechanisms, working identically

29. In a pediatric context, which advantage does topical fluoride application have over systemic fluoride supplementation?
(A) Lower safety margin regarding fluoride ingestion
(B) Less control over individual dosage
(C) Immediate enamel-level remineralization
(D) Ability to completely eradicate cariogenic bacteria

30. Which is NOT a recommended source of systemic fluoride for children in non-fluoridated areas?
(A) Fluoride supplements in tablet form
(B) Fluoridated bottled water specifically labeled as containing fluoride
(C) Cow's milk that has been fluoridated to recommended levels
(D) Prescription mouth rinses with high fluoride concentration

31. A 3-year-old child has a high caries risk and inadequate fluoride intake. Which of the following topical fluoride regimens is MOST recommended?
(A) Weekly application of fluoride foam in the office
(B) Daily use of a high-fluoride prescription toothpaste
(C) Twice-yearly professional fluoride varnish applications
(D) Mouthrinse with 0.2% sodium fluoride twice a day

32. How does prolonged thumb-sucking beyond preschool years MOST commonly affect the developing dentition?
(A) It promotes normal occlusion
(B) It leads to anterior open bite and possibly proclined maxillary incisors
(C) It results in posterior crossbite exclusively
(D) It rarely affects tooth alignment when continued past age 5

33. Which is the MOST common oral habit seen in pediatric patients?
(A) Mouth breathing
(B) Thumb-sucking
(C) Lip biting
(D) Tongue thrusting

34. A 6-year-old child habitually breathes through the mouth due to chronic nasal obstruction. Which dental effect is MOST likely to occur if this habit persists?
(A) Anterior crossbite
(B) Posterior open bite
(C) Long, narrow face with high palatal vault
(D) Reduction in the vertical facial dimension

35. A 7-year-old child frequently thrusts the tongue forward during swallowing. An anterior open bite is detected. Which initial management step is MOST appropriate for addressing tongue thrusting?
(A) Orthognathic surgery
(B) Myofunctional therapy exercises
(C) Immediate full banded orthodontic treatment
(D) Extraction of anterior primary teeth

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36. A 10-year-old with persistent thumb-sucking presents with proclined maxillary incisors and a mild anterior open bite. The child has tried simple behavioral modifications without success. Parents ask about potential dental appliances. Which appliance is commonly used to help discourage thumb-sucking?
(A) Fixed space maintainer
(B) Bluegrass appliance
(C) Rapid palatal expander
(D) Fixed anterior bite plate

37. A 6-year-old patient with mild cerebral palsy requires routine dental care. Parents report difficulties in maintaining oral hygiene. The child has moderate plaque accumulation and incipient caries. What is the MOST suitable approach for a successful dental visit?
(A) Pharmacological restraint
(B) Tell-Show-Do with caregiver involvement
(C) Immediate sedation without trying alternative methods
(D) Physical immobilization by multiple staff

38. A 9-year-old with a history of congenital heart disease is referred for dental treatment to prevent bacteremia risk. The child has multiple carious lesions in primary and early mixed dentition. Parents report the child experiences anxiety during medical procedures. Which strategy is MOST appropriate to manage dental treatment while minimizing stress and infection risk?
(A) Multiple short visits, no sedation
(B) Single visit comprehensive care under general anesthesia
(C) Pharmacological sedation with nitrous oxide for each lesion separately
(D) Postpone all treatment until the permanent dentition erupts

39. What is the term "Medically Compromised Child" best defined as in pediatric dentistry?
(A) A child who exhibits mild anxiety during dental visits
(B) A child with systemic conditions that may complicate routine dental treatment
(C) A child who refuses to undergo radiographic procedures
(D) A child requiring no special modifications for safe dental care

40. Why must antibiotic prophylaxis be considered for certain medically compromised children before dental procedures?
(A) It completely eradicates oral bacteria
(B) It guarantees zero risk of infection
(C) It reduces the risk of bacteremia leading to systemic complications
(D) It is mandatory for all pediatric dental patients regardless of condition

41. Which medically compromised condition among children is MOST commonly linked with increased gingival bleeding and bruising during dental treatments?
(A) Juvenile rheumatoid arthritis
(B) Hemophilia
(C) Autism spectrum disorder
(D) Cystic fibrosis

42. In a child on long-term corticosteroid therapy, which oral manifestation should a pediatric dentist be MOST vigilant about?
(A) Enlarged tongue
(B) Delayed tooth eruption
(C) Candidal infections
(D) Benign migratory glossitis

43. Assertion: Pediatric patients with uncontrolled diabetes mellitus are at a higher risk for periodontal disease.
Reason: Hyperglycemia can impair immune responses and wound healing in the oral cavity.
(A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.
(B) Both Assertion and Reason are true, but the Reason is NOT the correct explanation of the Assertion.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

44. For a child with a significant cardiac condition, when is antibiotic prophylaxis generally recommended for dental procedures?
(A) For all dental procedures, including orthodontic bracket placement
(B) Only for procedures that involve manipulation of gingival tissue or periapical region
(C) Never recommended
(D) Mandatory if the child is over 10 years old

45. A medically compromised child with chronic renal disease has severe halitosis and a metallic taste in the mouth. Which underlying factor can MOST likely cause this finding?
(A) Hyperthyroidism
(B) Uremia due to reduced kidney function
(C) Overproduction of saliva
(D) Normal childhood physiological changes

46. Assertion: Children with active cancer therapy require special dental management.
Reason: Aggressive chemotherapy can lead to mucositis, immunosuppression, and increased infection risk.
(A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.
(B) Both Assertion and Reason are true, but the Reason is NOT the correct explanation of the Assertion.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

47. In a medically compromised child with epilepsy, which dental intervention is MOST critical to address first?
(A) Correcting anterior crowding
(B) Removing carious lesions to prevent infection
(C) Whitening procedures for enamel stains
(D) Providing orthodontic alignment for posterior teeth

48. Which statement highlights a key difference between restorative therapy in pediatric patients and adults?
(A) Children's teeth have greater enamel thickness
(B) Pulp chambers in primary teeth are larger relative to crown size
(C) Primary teeth undergo minimal wear compared to adult teeth
(D) There is no difference; restorative therapy is identical for children and adults

49. Which of the following best describes a stainless steel crown's primary application in pediatric dentistry?
(A) Esthetic replacement in anterior permanent teeth
(B) Restoration of extensively carious primary molars
(C) Temporary coverage of fractured permanent incisors
(D) Orthodontic space maintainer in the posterior region

50. After performing a pulpotomy on a primary molar, which restoration is MOST commonly recommended to provide long-term success?
(A) Glass ionomer filling
(B) Amalgam filling
(C) Composite resin
(D) Stainless steel crown

51. Which of the following best defines "developmental milestone" in pediatric growth?
(A) An incidental behavior observed occasionally in early childhood
(B) A universal, predictable skill or ability acquired by children at a specific age range
(C) A hereditary trait unrelated to environmental factors
(D) A random achievement achieved without a standard time frame

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52. At approximately what age do the primary maxillary canines usually erupt?
(A) 6–8 months
(B) 12–14 months
(C) 16–18 months
(D) 19–20 months

53. Why is the primary dentition period crucial in a child's overall orofacial development?
(A) Primary teeth do not influence jaw growth or speech
(B) Primary teeth maintain space for permanent successors and aid in normal chewing and speech
(C) Primary teeth are expendable placeholders with minimal functional roles
(D) Primary teeth must be retained until age 16 to avoid malocclusion

54. All of the following are normal features of primary tooth morphology EXCEPT:
(A) A narrower occlusal table
(B) Thinner enamel and dentin layers
(C) Larger pulp chambers relative to crown size
(D) Significantly longer clinical crown than root

55. Which of the following best contrasts Early Childhood Caries (ECC) with rampant caries in slightly older children?
(A) ECC exclusively affects posterior teeth; rampant caries spares molars
(B) ECC often begins on maxillary anterior teeth; rampant caries can involve multiple teeth in various arches
(C) Rampant caries solely results from poor oral hygiene, whereas ECC arises from only dietary factors
(D) ECC never advances to involve posterior teeth

56. In preventing dental caries in preschoolers, which approach is MOST endorsed by pediatric dentistry guidelines?
(A) Periodic professional fluoride applications and parental education on oral hygiene
(B) Ignoring dietary habits until the child is in school
(C) Using antibiotics routinely to suppress oral bacteria
(D) Delaying the first dental visit until the child can cooperate perfectly

57. A 4-year-old with mild dental fluorosis spots is brought in by concerned parents. They confirm living in a fluoridated community but also giving the child fluoride supplements. Which immediate action is MOST appropriate to reduce further fluorosis risk?
(A) Stop all fluoride exposure, including fluoridated toothpaste
(B) Eliminate supplemental fluoride while continuing regular brushing with a pea-sized amount of fluoride toothpaste
(C) Increase systemic fluoride supplements for better enamel strength
(D) Switch to non-fluoridated water only, with no topical fluoride

58. A 2-year-old repeatedly falls asleep nursing and shows early white spot lesions on maxillary anterior teeth. What is the MOST effective initial intervention?
(A) Stainless steel crowns on all maxillary anterior teeth
(B) Discontinuing nighttime feeding and introducing water rinses
(C) Pulpectomy of anterior teeth followed by permanent restorations
(D) Use of adult-strength fluoride mouthrinse twice daily

59. In fluoride metabolism, which action is considered KEY to reducing enamel solubility?
(A) Fluoride partially replaces hydroxyl ions in hydroxyapatite, forming fluorapatite
(B) Fluoride dissolves all organic components of the enamel
(C) Fluoride drastically lowers salivary pH
(D) Fluoride only functions through antibacterial mechanisms, not affecting enamel structure

60. In the standard protocol for fluoride varnish application to a preschool child, which of the following steps is INCORRECT?
(A) Dry the tooth surfaces before application
(B) Use a thin layer of varnish over all high-risk surfaces
(C) Rinse thoroughly with water immediately after applying the varnish
(D) Advise not to brush for the rest of the day

61. A toddler in a community with 0.7 ppm fluoride in water but high sugar intake exhibits frequent caries. What is the LIKELIEST main factor contributing to ongoing caries risk?
(A) Overexposure to fluoride
(B) Excess sugar consumption offsetting the protective fluoride effect
(C) Insufficient fluoride in community water
(D) Complete immunity to fluoride benefits

62. Excessive thumb-sucking during early childhood can lead to which common effect on the alveolar arch form?
(A) Constriction of the maxillary arch and development of an anterior open bite
(B) Widening of the mandibular arch with posterior crossbite
(C) No effect on the alveolar process
(D) Overdevelopment of the posterior alveolar ridges

63. An 8-year-old with a chronic nail-biting habit presents with mild incisor chipping. Parents want guidance. Which approach is MOST effective initially?
(A) Immediate full orthodontic brackets
(B) Positive reinforcement and habit awareness
(C) Extraction of chipped incisors
(D) Use of sedation to control habit

64. A 5-year-old presents with partial collapse of the anterior palate vault and a noticeable anterior open bite from a reported pacifier habit. Which condition is MOST consistent with these findings?
(A) Mouth breathing
(B) Tongue tie
(C) Anterior crossbite
(D) Prolonged pacifier or digit-sucking malocclusion

65. For a 3-year-old who persistently mouth-breathes because of enlarged adenoids, which coordinated management step is MOST likely to help correct the underlying issue?
(A) Orthodontic expansion without addressing airway
(B) Immediate extraction of all primary canines
(C) ENT (Ear, Nose, Throat) referral for possible adenoidectomy
(D) Placing fixed habit breaker on anterior teeth

66. Current pediatric dentistry guidelines recommend evaluating children for detrimental oral habits (like thumb-sucking) and intervening if the habit persists beyond which approximate age?
(A) 1 year
(B) 3 years
(C) 4 years
(D) 10 years

67. A 7-year-old with unknown medical history experiences excessive bleeding after an extraction. Which condition must be HIGHLY suspected as a potential underlying issue?
(A) Asthma
(B) Coagulation disorder (e.g., Hemophilia)
(C) Autism spectrum disorder
(D) ADHD (Attention Deficit Hyperactivity Disorder)

68. In pediatric patients with uncontrolled Type 1 diabetes, which oral symptom is commonly reported?
(A) Excessive calculus formation
(B) Lowered risk of caries due to decreased sugar intake
(C) Delayed wound healing and gingival inflammation
(D) Permanent tooth ankylosis

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69. Assertion: Children with congestive heart failure are at higher risk for dental complications.
Reason: Reduced cardiac output may compromise oral tissue vascularity and immune function.
(A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.
(B) Both Assertion and Reason are true, but the Reason is NOT the correct explanation of the Assertion.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

70. A child with mild hemophilia requires a pulpotomy on a primary molar. Which is the MOST appropriate measure before the procedure?
(A) Perform pulpotomy without special considerations
(B) Consult hematologist about factor replacement or prophylaxis before treatment
(C) Avoid local anesthesia
(D) Delay all dental treatment until permanent teeth erupt

71. A 5-year-old child with suspected dentinogenesis imperfecta is referred for radiographic assessment. Which radiographic finding is MOST indicative of dentinogenesis imperfecta?
(A) Radiolucent areas in the pulp
(B) Obliteration of pulp chambers and canals
(C) Large pulp chambers with thin enamel
(D) No difference compared to normal teeth

72. A 3-year-old child with frequent ear infections uses a sweetened liquid antibiotic. Parents report increased plaque. Which step is MOST effective to reduce caries risk?
(A) Discontinue antibiotic
(B) Wipe teeth or rinse after each dose
(C) Increase antibiotic dosage
(D) Stop brushing to avoid discomfort

73. A 6-year-old child has multiple carious primary molars but becomes extremely anxious in the dental chair. Examination reveals no acute infection, yet the child cannot cooperate. The parents want treatment completed efficiently. Which management technique is MOST likely appropriate?
(A) Minimal sedation
(B) Voice control only
(C) General anesthesia
(D) Nitrous oxide–oxygen sedation

74. A 9-year-old with asthma requires restorations on multiple primary molars. The child uses a steroid inhaler daily. Which key precaution is MOST recommended to prevent oral complications?
(A) Have the child gargle or rinse after each inhaler use
(B) High-dose fluoride mouthwash daily
(C) Avoid local anesthesia
(D) Perform all restorations without a rubber dam

75. A 7-year-old with Down syndrome needs conservative restorations for incipient interproximal caries. Parents mention that the child often resists brushing, leading to frequent plaque buildup. On examination, generalized gingivitis is evident, and the child has a short attention span and limited verbal communication. What is the MOST appropriate strategy to achieve successful treatment and improved home care?
(A) Forced restraint for each filling
(B) Short, behavior-focused appointments using Tell-Show-Do and frequent breaks
(C) Referral for full-mouth rehabilitation under general anesthesia
(D) Prescribe antibiotics pre-emptively for gingivitis

76. Which term best describes the process of removing irreversibly inflamed coronal pulp tissue in a primary tooth while maintaining a healthy vital radicular pulp?
(A) Pulpectomy
(B) Pulpotomy
(C) Apexification
(D) Apexogenesis

77. Which of the following materials is MOST commonly used for pulpotomy in primary teeth?
(A) Mineral trioxide aggregate (MTA) or Formocresol
(B) Glass ionomer sealant
(C) Composite resin
(D) Gutta-percha

78. Why is stainless steel crown placement often preferred over composite restorations after pediatric pulpotomy?
(A) Stainless steel crowns are less durable
(B) Composite restorations expand the tooth structure
(C) Stainless steel crowns offer full coronal coverage and better longevity
(D) Composite restorations are known to cause pulp necrosis

79. All of the following are recognized indications for pulpectomy in a primary tooth EXCEPT:
(A) Irreversible pulpitis in both coronal and radicular pulp
(B) Necrotic radicular pulp with or without periapical involvement
(C) Restorable tooth with healthy supporting structures
(D) Minimal coronal pulp exposure with vital radicular tissue

80. Which statement correctly contrasts pulpotomy and pulpectomy in pediatric dentistry?
(A) Pulpotomy removes the radicular pulp; pulpectomy removes only superficial layers of the coronal pulp
(B) Pulpotomy addresses only coronal pulp; pulpectomy removes coronal and radicular pulp
(C) Pulpectomy is suitable only for vital pulp, while pulpotomy is for necrotic pulp
(D) Both procedures remove the entire pulp from crown to apex

81. A 6-year-old presents with a large carious lesion on a primary mandibular second molar close to the pulp, but no signs of infection or swelling. Which treatment is BEST indicated?
(A) Extraction
(B) Direct pulp capping and watchful waiting
(C) Pulpotomy followed by stainless steel crown
(D) Pulpectomy with gutta-percha obturation

82. A 4-year-old complains of pain in a severely carious primary first molar with radicular involvement seen on radiographs. What is the MOST suitable endodontic management?
(A) Extraction, given the child's young age
(B) Simple glass ionomer restoration without pulp therapy
(C) Pulpectomy and placement of a resorbable filling, followed by a crown
(D) Vital pulpotomy with formocresol

83. After a successful pulpectomy in a primary molar, which next step is typically indicated to ensure long-term success?
(A) Place a temporary zinc oxide eugenol filling only
(B) Refuse to place any further restoration
(C) Complete coverage with a stainless steel crown
(D) Extraction after 1 month to prevent reinfection

84. Which key factor determines if a pulpotomy or pulpectomy is performed in a carious primary tooth?
(A) Presence or absence of radicular pathology
(B) Size of the carious cavity alone
(C) Availability of stainless steel crowns
(D) Parent's preference for esthetics

85. During a pediatric pulpectomy, which of the following steps is INCORRECT?
(A) Completely remove necrotic pulp from coronal and root canals
(B) Irrigate canals with a suitable disinfectant solution
(C) Use a permanent root canal filling material like gutta-percha

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(D) Place a resorbable filler in the canal, then restore with a crown

86. Which primary tooth is MOST likely to require pulpotomy or pulpectomy treatments due to its morphology and susceptibility to caries?
(A) Primary mandibular incisor
(B) Primary maxillary incisor
(C) Primary mandibular first molar
(D) Primary maxillary canine

87. In pediatric patients, how does untreated carious primary molars often affect the eruption of successor permanent teeth?
(A) Completely no effect
(B) May lead to space loss and malalignment of the permanent successor
(C) Stimulates early eruption of the permanent successor
(D) Invariably causes ankylosis of the permanent germ

88. A 5-year-old with neglected caries in multiple primary teeth presents with an abscess around the lower second molar. Which complication is MOST concerning if left untreated?
(A) Superficial enamel discoloration
(B) Loss of arch length
(C) Cosmetic tooth shape change
(D) Minor gingival inflammation

89. A 6-year-old complains of dull pain in a restored primary molar. Radiographic exam reveals a radiolucency in the furcation area. Which diagnosis is MOST likely?
(A) Reversible pulpitis
(B) Internal resorption
(C) Furcation involvement typical of radicular pathology in primary molar
(D) Enamel hypocalcification

90. A child presents with chronic abscess drainage from a primary molar, suggesting necrotic pulp. The tooth is restorable structurally. What is the BEST management choice?
(A) Extraction
(B) Direct pulp capping
(C) Pulpectomy with resorbable filling
(D) Pulpotomy

91. According to pediatric dentistry standards, what is the recommended recall interval for radiographic evaluation in a child at high caries risk?
(A) Every 6–12 months
(B) Every 2–3 years
(C) Only when pain arises
(D) Never, to limit radiation exposure

92. A 4-year-old presents with multiple painless, smooth surface caries and a history of abnormal sweating and heat intolerance. Which underlying condition should be considered in the differential diagnosis?
(A) Cleidocranial dysplasia
(B) Ectodermal dysplasia
(C) Amelogenesis imperfecta
(D) Hypothyroidism

93. Which clinical finding is MOST characteristic of mouth breathing in children?
(A) Lips frequently sealed during rest
(B) Hyperactive gag reflex
(C) Dry anterior gingiva and open lip posture
(D) Excessive lateral tongue thrust during swallowing

94. Assertion: Fluoride gels are always superior to fluoride varnishes in preventing caries.
Reason: Fluoride varnish adheres to tooth surfaces for an extended period, improving fluoride uptake.
(A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.
(B) Both Assertion and Reason are true, but the Reason is NOT the correct explanation of the Assertion.

(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

95. A 5-year-old with moderate sedation for caries treatment starts showing signs of respiratory depression. What is the FIRST management step?
(A) Increase sedation dosage
(B) Terminate procedure and support the airway
(C) Proceed quickly with the dental treatment to finish
(D) Give a high-sugar drink

96. For a child with a history of congenital heart disease, which diagnostic tool is MOST relevant before planning invasive dental procedures?
(A) Complete blood count for anemia
(B) Prothrombin time
(C) Echocardiogram report
(D) Pulmonary function test

97. A 4-year-old with severe autism resists sitting in the dental chair and requires urgent treatment of a painful abscess. Which approach is MOST appropriate?
(A) Restraint without sedation
(B) Sedation or general anesthesia in a controlled environment
(C) Attempt to force cooperation with repeated instructions
(D) Dismiss until cooperation improves

98. An 8-year-old with ADHD requires extensive restorative work. He cannot stay focused for long. Parents report moderate hyperactivity. Which management technique is MOST likely to improve cooperation?
(A) Sedation alone
(B) Voice control with lengthy appointments
(C) Structured "tell-show-do" with short, well-planned visits
(D) Physical restraint by staff

99. A 5-year-old with uncontrolled epilepsy needs multiple pulpotomies. He has frequent seizures and is on anticonvulsants. Which is the MOST prudent dental approach?
(A) Schedule multiple brief appointments with seizure precautions
(B) Attempt all pulpotomies without local anesthesia
(C) Provide sedation with no medical consultation
(D) Defer all dental care until teenage years

100. A 7-year-old with severe asthma, requiring multiple hospitalizations, presents with rampant caries in all primary molars. The pediatrician highlights the child's high risk of respiratory compromise under stress. The child struggles with standard sedation due to airway reactivity. Parents request definitive care to avoid repeated visits. What is the BEST treatment approach?
(A) Multiple sedation visits in the dental office
(B) General anesthesia in a hospital setting, completing restorations/extractions
(C) Attempt partial restorations without local anesthesia
(D) Defer intervention and rely on prophylactic antibiotics

101. In pediatric dentistry, what does the term "anticipatory guidance" refer to?
(A) A legal contract with parents before treatment
(B) A technique solely for behavior management under sedation
(C) Providing proactive counseling and instructions to parents about future oral health needs
(D) Limiting discussions with parents to emergency-only issues

102. Which craniofacial structure is primarily responsible for downward and forward growth of the face in early childhood?
(A) Maxillary tuberosity
(B) Mandibular condyle
(C) Coronoid process of the mandible
(D) Temporomandibular joint disk

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103. Why is understanding eruption timing crucial in pediatric dentistry?
(A) It ensures immediate surgical exposure of primary teeth that erupt slightly late
(B) It helps predict space availability and identify disturbances that might need intervention
(C) It has no bearing on long-term occlusion
(D) It only matters for calculating chronological age

104. Which of the following is NOT an indication for using a space maintainer in pediatric dentistry?
(A) Early loss of a primary second molar
(B) Congenital absence of a primary tooth affecting arch length
(C) Delayed eruption of a permanent tooth after the natural exfoliation of a primary tooth
(D) Maintaining space for a necrotic tooth that remains in place but is restorable

105. How does a fixed space maintainer differ from a removable one in pediatric patients?
(A) A fixed maintainer often demands more patient compliance than a removable appliance
(B) A removable maintainer is always placed in the posterior region, whereas a fixed is for anterior
(C) A fixed maintainer is cemented, requiring less daily cooperation, while a removable one relies on patient compliance
(D) A removable maintainer is contraindicated in all children under age 10

106. A 5-year-old prematurely loses a primary mandibular second molar. Which space maintainer is MOST suitable in the absence of permanent first molars?
(A) Band and loop
(B) Nance appliance
(C) Distal shoe
(D) Lower lingual holding arch

107. An 8-year-old has lost the primary maxillary first molar prematurely. The permanent first molar is fully erupted. Which space maintainer is MOST commonly recommended?
(A) Distal shoe
(B) Band and loop
(C) Removable partial denture
(D) Transpalatal arch

108. Following early extraction of primary mandibular canines due to ectopic eruption of permanent incisors, the lower anterior space seems compromised. What should be done next?
(A) Do nothing and wait for natural alignment
(B) Place a lower lingual holding arch to stabilize anterior tooth position
(C) Extract the permanent incisors to regain space
(D) Use a distal shoe appliance on each canine site

109. Which key component distinguishes the Nance appliance from a transpalatal arch in the maxillary arch?
(A) Use of a single band
(B) An acrylic button resting on the palate
(C) A distal extension into the retromolar area
(D) Interference with normal speech patterns

110. In the fabrication and placement of a distal shoe space maintainer, which of the following steps is INCORRECT?
(A) Making an accurate impression of the alveolar ridge after extraction
(B) Measuring the subgingival path for the permanent first molar's eruption
(C) Placing the metal extension just coronal to the marginal gingiva
(D) Ensuring it is checked periodically for proper tissue adaptation

111. In a child with premature loss of a primary mandibular second molar, what is the LIKELIHOOD of developing a mesial drift of the first permanent molar if no space maintainer is placed?
(A) Very low, around 5%
(B) Moderate, around 25%
(C) High, commonly above 70%
(D) Negligible, because the first permanent molar seldom moves

112. How can prolonged retention of a primary tooth with no successor lead to orthodontic complications?
(A) Causes the jaws to overgrow spontaneously
(B) Contributes to alveolar bone loss and no effect on alignment
(C) Results in drifting or tipping of adjacent teeth, leading to malocclusion
(D) Stimulates earlier exfoliation of other primary teeth

113. An 11-year-old with missing mandibular second premolars retains the primary second molars. The dentist suspects no permanent successors. What is the BEST next step to confirm?
(A) Panoramic radiograph
(B) Caries risk assessment
(C) Full mouth series of periapicals
(D) Salivary flow test

114. A child's panoramic radiograph shows no developing tooth germs for the permanent lower second premolars, and the primary second molars are intact. Which condition should be recorded in the chart?
(A) Macrodontia
(B) Hypodontia
(C) Gemination
(D) Dilaceration

115. In a 10-year-old with congenitally missing lower second premolars and well-retained primary second molars, the occlusion is functional. What is the MOST conservative management approach?
(A) Immediate extraction of the primary second molars
(B) Retain the primary second molars and monitor occlusal development
(C) Place implants immediately in the vacant second premolar sites
(D) Full orthodontic treatment to close the space

116. According to recommended guidelines, from what age can children generally begin using dental floss for proximal cleaning if their dexterity allows?
(A) 2–3 years
(B) 3–4 years
(C) 8–10 years
(D) 10–12 years

117. A 7-year-old whose upper primary incisors haven't exfoliated, though the permanent successors are visible on radiographs and appear ready to erupt. Which red flag could indicate an eruption disturbance?
(A) Increased mobility of the primary incisors
(B) Ectopic eruption path pressing on the root of the primary incisor
(C) Shade difference between primary and permanent teeth
(D) Child's complaint of mild gum irritation

118. Which key clinical sign can indicate potential infraocclusion of a primary molar?
(A) The occlusal surface of the primary molar appears progressively lower than adjacent teeth
(B) Excessive mobility of the primary molar
(C) Rapid color change to a gray hue
(D) A broad, flared root trunk visible clinically

119. Assertion: Children with infraoccluded primary molars often require early intervention.
Reason: Ankylosis of the primary tooth can lead to a vertical alveolar bone deficiency if untreated.
(A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.
(B) Both Assertion and Reason are true, but the Reason is NOT the correct explanation of the Assertion.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

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120. For an infraoccluded primary molar that has a viable permanent successor visible radiographically, which management step is MOST commonly indicated?
(A) Elective extraction to allow spontaneous eruption of successor
(B) Building up the occlusal surface with composite and ignoring the ankylosis
(C) Immediate placement of an implant
(D) No intervention unless pain arises

121. Which imaging technique is MOST suitable for detecting early ankylosis in a primary molar?
(A) Periapical radiograph with paralleling technique
(B) Occlusal radiograph
(C) Panoramic radiograph
(D) Cone-beam computed tomography (CBCT)

122. A 6-year-old child's mandibular first primary molar is noticeably below occlusal level. Radiograph suggests partial ankylosis. No mobility is present, and the permanent premolar bud is normal. Which action is MOST appropriate?
(A) Monitor eruption periodically
(B) Extract immediately
(C) Place a stainless steel crown
(D) Perform pulpotomy

123. A 7-year-old is found to have partial infraocclusion of both primary mandibular second molars. The parent is worried about future crowding. The panoramic radiograph shows developing second premolars with normal morphology. Which management plan is MOST suitable at this stage?
(A) Extract both primary molars immediately
(B) Observe eruption while maintaining regular check-ups
(C) Install implants in the second premolar region
(D) Refer for orthognathic surgery evaluation

124. A 9-year-old's radiograph reveals an impacted permanent maxillary canine, with the primary canine still in place. No pathologic findings are noted, but the eruption path appears blocked. The dentist decides on interceptive extraction of the primary canine. Which outcome is MOST expected?
(A) Spontaneous eruption of the permanent canine
(B) Apical migration of the impacted canine
(C) Rapid closure of the canine space
(D) Development of an anterior crossbite

125. A 10-year-old with a palatally impacted maxillary canine is referred for interceptive treatment. The orthodontist recommends extracting the primary canine and applying a removable device to create space. The child has moderate crowding and still has multiple primary teeth. Parents want a less invasive approach. Which rationale justifies interceptive extraction in this case?
(A) It immediately perfects canine alignment
(B) Extraction of the primary canine can redirect the impacted canine's eruption path
(C) Primary canines are not needed after age 8
(D) Interceptive extraction rarely benefits impacted canines

126. In pediatric restorative dentistry, what is a "preventive resin restoration" (PRR)?
(A) A full-coverage crown used after pulpotomy
(B) A short-term temporary filling for large carious lesions
(C) A conservative restoration of incipient pit-and-fissure caries combined with sealant application
(D) An orthodontic device to maintain arch form

127. Which filling material is often favored for Class I PRRs in primary teeth due to fluoride release and chemical adhesion?
(A) Amalgam
(B) Zinc phosphate cement
(C) Glass ionomer or resin-modified glass ionomer
(D) Dental gold foil

128. Why are resin-modified glass ionomer (RMGI) restorations beneficial in pediatric patients compared to conventional glass ionomer?
(A) They lack any fluoride release
(B) They cure spontaneously in saliva without light activation
(C) They exhibit improved strength, esthetics, and lower solubility while still providing fluoride release
(D) They degrade quickly, making them ideal for short-term restorations

129. All of these are advantages of composite resin restorations in children EXCEPT:
(A) Esthetic appearance
(B) Potential for minimal tooth preparation
(C) High brittleness leading to frequent bulk fractures
(D) Good adhesion with bonding agents

130. Which statement best distinguishes conventional glass ionomer from composite resin in pediatric restorations?
(A) Glass ionomer is known for better esthetics than composite
(B) Composite resin provides fluoride release, while glass ionomer does not
(C) Glass ionomer chemically bonds to tooth structure and releases fluoride; composite relies on micromechanical bonding and has limited fluoride release
(D) Both require equal isolation and dryness during placement

131. For a 6-year-old with high caries risk and a moderate-sized Class II lesion in a primary molar, which restorative material is MOST appropriate to balance longevity, moisture tolerance, and fluoride release?
(A) Dental amalgam
(B) Resin-modified glass ionomer cement
(C) Full ceramic inlay
(D) Direct gold foil

132. A 7-year-old with restless behavior presents for an occlusal composite restoration. Which step is MOST crucial for a successful bond in a mildly moist environment?
(A) Place composite directly on unetched enamel
(B) Thoroughly dry the tooth for 10 minutes
(C) Use a self-etching bonding system that tolerates slight moisture
(D) Rely on the child's spit as a bonding agent

133. A 5-year-old with multiple proximal lesions on primary molars has difficulty cooperating for rubber dam placement. Which alternative isolation method is MOST effective?
(A) Using nothing at all
(B) Isolite or similar isolation device to control moisture
(C) Just instruct the child to keep their mouth open
(D) Sealants only, skipping the restorative step

134. Which key feature of stainless steel crowns makes them particularly advantageous for pediatric restorations?
(A) They require no tooth preparation at all
(B) They are biodegradable and dissolve over time
(C) They provide full coronal coverage, preventing recurrent decay
(D) They can be used interchangeably in adults

135. When preparing a primary molar for a stainless steel crown, which of these steps is INCORRECT?
(A) Performing occlusal reduction of about 1–1.5 mm
(B) Reducing proximal surfaces to break contact
(C) Placing a heavy chamfer margin around the entire tooth
(D) Rounding all line angles and smoothing

136. In a primary molar treated with a pulpotomy, what is the LIKELY success rate if a stainless steel crown is placed properly and the radicular pulp remains healthy?
(A) Around 30%
(B) Approximately 50%

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(C) Roughly 70%
(D) 80–90% or higher

137. How does a neglected interproximal lesion in a primary molar often lead to the need for a stainless steel crown?
(A) It disappears spontaneously once the child's diet changes
(B) Progression undermines cusps, leading to a large cavity requiring full coverage
(C) It always remains superficial and doesn't compromise tooth integrity
(D) It self-seals if left untouched

138. A 4-year-old's primary molar has a deep cavity on the distal aspect. The tooth is restorable, but moisture control is challenging. Which restorative approach is MOST practical?
(A) Class II composite resin
(B) Stainless steel crown
(C) Partial gold onlay
(D) Direct porcelain inlay

139. A 5-year-old with a large carious lesion on a primary first molar experiences spontaneous pain at night, indicating possible pulp involvement. Radiograph shows no radicular pathology. Which diagnosis is MOST consistent?
(A) Reversible pulpitis
(B) Irreversible pulpitis of the coronal pulp only
(C) Necrotic pulp
(D) Chronic apical abscess

140. In the scenario above (Question 139), what is the BEST treatment approach?
(A) Indirect pulp capping
(B) Pulpotomy
(C) Pulpectomy
(D) Extraction

141. According to pediatric pulp therapy guidelines, which medicament is frequently used in pulpotomy to encourage radicular pulp healing?
(A) Eugenol alone
(B) Formocresol or Mineral Trioxide Aggregate (MTA)
(C) Phosphoric acid etchant
(D) Sodium perborate

142. A 4-year-old has a history of receiving multiple pulpotomies on primary molars but continues to complain of intermittent pain. Radiographs show external root resorption in one treated tooth. Which red flag condition might be occurring?
(A) Ectopic eruption
(B) Internal resorption
(C) Pulp canal calcification
(D) Pulp therapy failure with radicular pathology

143. Assertion: Pulp therapy failure in primary teeth may lead to damage in the developing permanent successor.
Reason: Periapical or radicular infections can traverse the developing follicle, causing enamel defects or malformation.
(A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.
(B) Both Assertion and Reason are true, but the Reason is NOT the correct explanation of the Assertion.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

144. A primary molar with failing pulpotomy now exhibits a chronic sinus tract. Radiograph shows periapical radiolucency. Which procedure is MOST appropriate?
(A) Re-do the pulpotomy
(B) Pulpectomy or extraction, depending on tooth restorability and root condition
(C) Placement of more formocresol
(D) Simple antibiotic therapy without endodontic treatment

145. In determining whether to proceed with pulpectomy or extraction for a failing pulpotomy, which diagnostic information is MOST critical?
(A) Caries risk assessment alone
(B) Child's preference for sedation
(C) Extent of root resorption and presence of periapical pathology on radiographs

(D) Color of the primary crown

146. A 6-year-old has a large carious lesion in a primary molar with a history of lingering pain. Radiograph shows possible radicular involvement. Which pulp therapy is MOST indicated?
(A) Direct pulp capping
(B) Indirect pulp capping
(C) Pulpotomy
(D) Pulpectomy

147. A 4-year-old with a history of frequent snacking presents with new occlusal caries on two primary second molars. The dentist recommends partial caries removal and sealing. Which technique is being suggested to control lesion progression while preserving tooth vitality?
(A) Pulpectomy
(B) Non-restorative cavity control
(C) Atraumatic restorative treatment (ART)
(D) Hall technique

148. A 5-year-old with moderate cooperation and occlusal decay in a primary molar is selected for the Hall technique. The child has no radiographic or clinical signs of pulp involvement. What is the MOST critical step for success?
(A) Complete caries excavation
(B) Local anesthesia and rubber dam
(C) Selecting a proper-fitting stainless steel crown and ensuring it fully seats
(D) Leaving the tooth unsealed for self-arrest

149. A 6-year-old with poor compliance and multiple carious primary molars is considered for the Hall technique. Parents question its safety. Radiographs show no pulp involvement or pathology. The dentist explains that by sealing the caries under a stainless steel crown, the bacterial environment changes. Which statement MOST accurately describes this microbial shift?
(A) Bacteria increase in number but lose virulence
(B) The lesion expands rapidly beneath the crown
(C) Bacteria become starved of carbohydrates, reducing acid production
(D) Bacteria mutate to more virulent strains

150. What is the primary goal of the Atraumatic Restorative Treatment (ART) approach in pediatric dentistry?
(A) Achieving a permanent ceramic inlay without local anesthesia
(B) Using rotary instruments to remove all caries under sedation
(C) Minimally invasive caries excavation using hand instruments and placing an adhesive restorative material
(D) Applying composite with a high-speed handpiece for immediate esthetics

151. In pediatric dentistry, what does the term "behavior shaping" involve?
(A) Using only pharmacological agents to achieve cooperation
(B) Gradually guiding a child toward cooperative behavior by reinforcing desired actions
(C) Skipping all explanations and proceeding directly with treatment
(D) Allowing the child to decide which procedures to perform

152. According to the "Tell-Show-Do" technique, which step happens immediately after "Show"?
(A) The dentist explains the entire procedure in detail
(B) The dentist allows the child to perform the procedure on a model
(C) The dentist demonstrates the sensory experience and then performs the actual procedure (the "Do" step)
(D) The dentist postpones treatment until the child is older

153. How does positive reinforcement assist in pediatric dental behavior management?
(A) By punishing the child for not cooperating
(B) By immediately offering sedation if the child shows any reluctance
(C) By rewarding desired behavior, making the child more likely to repeat it
(D) By ignoring all communication and finishing quickly

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154. Which of the following is NOT a typical component of non-pharmacological behavior management?
(A) Voice control
(B) Distraction
(C) Parental separation when appropriate
(D) Forced restraint without consent

155. How do "aversive techniques" differ from "positive techniques" in pediatric behavior management?
(A) Aversive approaches involve sedation only; positive techniques are about restraint
(B) Aversive approaches use negative stimuli or reprimands to gain cooperation; positive rely on praise and rewards
(C) Positive techniques always involve sedation, aversive ones do not
(D) Both are considered first-line strategies in modern pediatric dentistry

156. In managing a cooperative 5-year-old during a restorative procedure, which behavior guidance technique is MOST appropriate as a first-line approach?
(A) Tell-Show-Do with positive reinforcement
(B) Immediate protective stabilization
(C) In-office general anesthesia
(D) Threatening to withhold rewards if the child cries

157. A 7-year-old patient becomes slightly anxious when the dentist applies local anesthetic gel and picks up the syringe. Which action is MOST effective to alleviate the child's mild fear?
(A) Avoid explaining anything to the child
(B) Abruptly inject without warning
(C) Use distraction and a calm tone of voice, explaining the steps briefly
(D) Switch to general anesthesia

158. A child with moderate anxiety still struggles to stay calm despite voice control and Tell-Show-Do. The dentist decides to attempt nitrous oxide sedation. What should be done FIRST?
(A) Immediately place the nasal hood without consent
(B) Provide thorough information to the parent/guardian and obtain informed consent
(C) Send the child home with oral sedatives
(D) Restrain the child physically

159. Which key feature makes nitrous oxide sedation favorable for many pediatric dental procedures?
(A) It produces deep unconsciousness
(B) It eliminates the need for local anesthesia
(C) It offers rapid onset and quick recovery while maintaining protective reflexes
(D) It requires extensive cardiac monitoring and fasting for 12 hours

160. In using nitrous oxide for a pediatric dental patient, which of the following steps is INCORRECT?
(A) Begin with 100% oxygen flow for a short period
(B) Slowly titrate nitrous oxide concentration upward while monitoring the child's response
(C) Provide no oxygen flush at the end of the procedure, ending sedation abruptly
(D) Keep verbal communication to reassure the child during sedation

161. For children who receive nitrous oxide sedation with proper technique, what is the LIKELY percentage who experience significant adverse reactions (e.g., severe nausea, vomiting)?
(A) More than 30%
(B) Between 15–20%
(C) Less than 5%
(D) Around 50%

162. When minimal sedation fails in a highly anxious child, what is the possible consequence if no alternative approach (e.g., deeper sedation or behavior management) is provided?
(A) The child may become extremely fearful, refuse future dental care, and develop untreated caries
(B) The child spontaneously overcomes anxiety without any intervention
(C) The child typically administers self-sedation at home
(D) The caries resolves naturally without treatment

163. A 5-year-old with severe anxiety and multiple carious teeth fails to cooperate under nitrous oxide. Parents request completion in one visit. What sedation option is MOST likely indicated?
(A) Oral sedation alone
(B) General anesthesia in a hospital setting
(C) Voice control
(D) Restraint without anesthesia

164. A child with autism spectrum disorder displays extreme sensitivity to dental instruments' sound and lights. Which method is MOST likely to reduce sensory overload during treatment?
(A) Forcing cooperation by ignoring the child's reactions
(B) Dim lighting, using noise-cancelling headphones or earplugs, and a gentle introduction of instruments
(C) Playing loud music to cover the noise of instruments
(D) Scheduling multiple short appointments without addressing sensory stimuli

165. A 6-year-old with mild intellectual disability exhibits some anxiety. The child can follow simple instructions but is easily distracted. Which approach is MOST appropriate for routine restorative care?
(A) Use of extreme voice control and threats
(B) Gentle "Tell-Show-Do," additional time for communication, and possible nitrous oxide
(C) No attempt at communication, immediate sedation
(D) Full general anesthesia for all procedures

166. According to standard pediatric dentistry guidelines, which of the following is TRUE regarding the presence of parents in the operatory?
(A) Parents must always be excluded
(B) Parents have no role once the child is seated
(C) Parents may remain if it helps the child feel secure, especially in younger children
(D) Parental presence invariably worsens child behavior

167. A usually cooperative child suddenly becomes very apprehensive, refusing to open his mouth. He clings to his mother. Which situation might be a "red flag" requiring more intensive sedation or a different approach?
(A) The child just had a good experience with another dentist
(B) The parent calmly reassures the child
(C) The child shows extreme fear with tears, trembling, and total unresponsiveness to usual calming measures
(D) The child is mildly hesitant but complies if coaxed

168. During behavior management, which key sign indicates a child is transitioning from mild anxiety to severe distress?
(A) Occasional fidgeting
(B) Making small requests for breaks
(C) Persistent crying escalating to screaming, physical resistance, and inability to communicate
(D) Willingness to continue after slight coaxing

169. Assertion: Using appropriate child-friendly language during dental procedures is crucial.
Reason: Complex medical jargon may heighten a child's anxiety due to incomprehension.
(A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.
(B) Both Assertion and Reason are true, but the Reason is NOT the correct explanation of the Assertion.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

170. A child under moderate sedation begins to cry and resist partway through the procedure, indicating they are not sufficiently sedated. Which step is MOST appropriate?
(A) Immediately switch to general anesthesia without regard to protocol
(B) Force the treatment to continue
(C) Reassure the child, consider supplemental sedation per treatment plan, or terminate the procedure if it's unsafe

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(D) Dismiss the child permanently from the practice

171. A 10-year-old indicates fear of the dentist. The dentist conducts a "Fear Survey Schedule for Children (FSSC)." What does this questionnaire primarily assess?
(A) Radiographic caries risk
(B) Specific stimuli or situations that elicit dental fear
(C) IQ levels related to oral hygiene understanding
(D) Visual acuity during treatment

172. A 4-year-old displays mild dental fear. The dentist uses "modeling" by letting the child watch an older sibling undergo a simple procedure calmly. What is this technique called?
(A) Audiovisual distraction
(B) Live modeling
(C) Negative reinforcement
(D) Voice control

173. A 7-year-old with ADHD is fidgety during restorative treatment. The dentist implements short intervals of work, praises the child frequently, and provides a small reward for each successful interval. Which behavior technique is being utilized?
(A) Flooding
(B) Systematic desensitization
(C) Reinforcement scheduling
(D) Physical restraint

174. A 6-year-old with severe autism avoids eye contact, resists sitting in the dental chair, and frequently covers his ears. The dentist tries gently placing the child's favorite soft music and dimming lights. What primary principle underlies these modifications?
(A) Sensory adaptation to reduce overstimulation
(B) Instilling fear to ensure compliance
(C) Increasing external stimuli for distraction
(D) Physical punishment

175. A 5-year-old who is terrified of "the dentist's drill" cries at the sound. The dentist uses a cordless slow-speed handpiece in a separate room to demonstrate the soft whirring, letting the child feel the vibration on a cotton roll. Then, the child is allowed to press the pedal briefly. Which psychological approach is being implemented to address the fear stimulus?
(A) Cognitive restructuring
(B) Systematic desensitization via controlled exposure to the feared sound and sensation
(C) Flooding with intense auditory stimuli
(D) Complete avoidance of the drill

176. What is the MAIN objective of the "2×2 Rule" sometimes referenced in pediatric patient communication?
(A) Always use two staff members for every two patients
(B) Simplify communication to two instructions repeated twice
(C) Encourage a maximum of two warnings before ending the appointment
(D) Give no instructions; let the child do all

177. What is "LIVE" modeling in a pediatric dental context typically?
(A) Watching a cartoon character receiving dental treatment
(B) Observing a cooperative peer or sibling undergoing a procedure
(C) Sitting alone in the operatory
(D) Using electronic sedation

178. How does "tell-play-do" differ from the traditional "tell-show-do"?
(A) "Tell-play-do" fully omits explaining the procedure
(B) "Tell-play-do" introduces an interactive game or playful element before performing the actual procedure
(C) "Tell-show-do" involves sedation, while "tell-play-do" does not
(D) They are identical, with no difference in approach

179. Which statement about behavior management in pediatric dentistry is INCORRECT?
(A) Pharmacological methods can be used if non-pharmacological techniques fail
(B) Voice control must always be accompanied by an explanation to the child about the reason for a louder or firmer tone
(C) Parental presence can sometimes support better cooperation
(D) Physical restraint is used only under specific, clearly defined conditions with consent

180. Which describes a key difference between "distraction" and "desensitization" in pediatric dentistry?
(A) Distraction shifts the child's focus away from unpleasant stimuli; desensitization gradually exposes the child to fear-inducing stimuli in a controlled manner
(B) Desensitization is only used with sedation, while distraction is non-pharmacological
(C) Distraction always involves music, whereas desensitization uses no external stimuli
(D) They are identical methods with no conceptual difference

181. An 8-year-old with mild anxiety asks constant questions during a restorative procedure, slowing progress. Which approach BEST maintains rapport yet encourages smoother progress?
(A) Ignore the child's questions entirely
(B) Provide brief, reassuring answers, then redirect focus to the procedure
(C) Tell the child not to talk at all
(D) Stop the procedure whenever the child speaks

182. A 4-year-old initially cooperates but starts crying when the handpiece noise begins. The dentist quickly turns on a child-friendly cartoon on an overhead screen. Which behavior technique is being applied?
(A) Distraction
(B) Live modeling
(C) Systematic desensitization
(D) Parental separation

183. A 9-year-old with significant caries in multiple teeth repeatedly cancels visits due to fear. The dentist decides to try systematic desensitization. Which is the BEST initial step?
(A) Schedule a long, comprehensive appointment for immediate restorations
(B) Have the child watch a friend calmly get a filling
(C) Begin by introducing very minor stimuli, like sitting in the dental chair for short intervals, gradually increasing exposure
(D) Immediately administer intravenous sedation

184. Which key action underlies the "Positive Pre-Visit Imagery" method?
(A) Showing graphic videos of worst-case dental scenarios
(B) Providing pleasant pictures or videos of children happily receiving dental care before the appointment
(C) Restricting all contact with dental images or discussions until the visit
(D) Telling the child they should expect pain

185. In employing "Voice Control" for a mildly uncooperative child, which step is INCORRECT?
(A) Changing voice tone or volume to gain the child's attention
(B) Continuing a stern tone indefinitely without returning to a softer voice
(C) Providing a brief explanation afterward to affirm a caring attitude
(D) Using the child's name firmly to direct them

186. If parental presence becomes a distraction (e.g., the parent appears anxious, interfering, or undermining instructions), what is the LIKELY outcome for the child's behavior?
(A) Child's behavior improves dramatically
(B) Child shows increased anxiety and reduced cooperation
(C) No effect at all
(D) Child spontaneously becomes more cooperative

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187. When a pediatric dentist uses repeated praise and tokens for cooperative behavior, which psychological principle is at play that CAUSES the child's cooperation to increase?
(A) Negative reinforcement
(B) Operant conditioning via positive reinforcement
(C) Classical conditioning
(D) Observational learning alone

188. A 6-year-old, previously uncooperative, improves after the dentist starts a "star chart," awarding a star for each successful visit. After five stars, the child receives a small toy. Which concept is illustrated?
(A) General anesthesia
(B) Token economy
(C) Voice control
(D) Negative reinforcement

189. A child repeatedly exhibits unmanageable behavior in the dental office despite sedation attempts. The dentist suspects an underlying behavioral or psychological issue. Which referral might be MOST appropriate for comprehensive assessment?
(A) Orthodontist
(B) Pediatric psychologist or child psychiatrist
(C) Oral surgeon
(D) Primary care physician

190. An 8-year-old becomes extremely distressed midway through restorative work and is hysterical despite sedation. The dentist cannot safely continue. What is the BEST next action?
(A) Forcefully complete the procedure
(B) Stop, console the child, possibly reschedule with a deeper sedation plan
(C) Increase sedation without caution
(D) Threaten the child with punishment

191. Which statement is TRUE regarding guidelines for protective stabilization (physical restraint) in pediatric dentistry?
(A) It requires no consent
(B) It is routinely applied for all preschool children
(C) It must be used only when absolutely necessary and with informed consent
(D) It ensures a child will have no psychological impact from restraint

192. A young child who cooperated well suddenly develops severe dental fear after a traumatic event at home (e.g., a house fire). Which factor might be driving this change in behavior?
(A) No correlation to the traumatic event
(B) Delayed tooth eruption
(C) Post-traumatic stress or heightened anxiety
(D) Loss of alveolar bone

193. Assertion: When a child demonstrates uncontrollable fear or pain, continuing treatment can be counterproductive.
Reason: Traumatic dental experiences can lead to dental phobia and avoidance of dental care in adulthood.
(A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.
(B) Both Assertion and Reason are true, but the Reason is NOT the correct explanation of the Assertion.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

194. A child with a history of repeated sedation failures needs extensive treatment. The dentist and parent discuss hospital-based general anesthesia. Why might this be indicated?
(A) The child does not deserve attempts at non-pharmacological management
(B) Hospital-based GA ensures the child remains fully conscious
(C) It allows comprehensive treatment in one session with full control of the airway, ensuring safety
(D) It is banned by most pediatric dental guidelines

195. Which instrument or measure might a pediatric dentist use to objectively gauge a child's anxiety level before a procedure?
(A) Dental Age Index
(B) Frankl Behavior Rating Scale
(C) CPITN (Community Periodontal Index of Treatment Needs)
(D) DMFT index

196. A 5-year-old shows mild fear but allows the dentist to place a mirror. Then she begins crying at the first sign of the handpiece sound. Which Frankl score might this behavior reflect?
(A) Definitely negative
(B) Negative
(C) Positive
(D) Definitely positive

197. An 8-year-old is generally pleasant, answers questions, and sits calmly. However, when the dentist begins excavation with a low-speed bur, he tenses up and asks to stop several times but resumes after reassurance. Which Frankl category BEST fits this behavior?
(A) Definitely negative
(B) Negative
(C) Positive
(D) Definitely positive

198. A child with known ADHD and a history of disruptive outbursts arrives for restorative care. The dentist pre-plans shorter appointments, minimal waiting times, and uses a structured approach with reward charts. Which principle is guiding this approach?
(A) Minimizing sedation for cost reasons
(B) Tailoring the dental setting to the child's specific behavioral and attention needs
(C) Forcing compliance by ignoring ADHD diagnosis
(D) Providing standard adult protocols

199. A 6-year-old with a history of severe anxiety has untreated rampant caries in multiple teeth. Parents report that the child refuses to sit in the dental chair at another office. The new dentist suggests an initial "non-treatment" visit to build rapport—showing the office, letting the child press chair buttons, explore the air/water syringe, and giving a small prize. The dentist schedules actual treatment once trust improves. Which behavior management concept does this plan reflect?
(A) Flooding exposure
(B) Deferred gratification
(C) Acclimatization or familiarization visit
(D) Negative reinforcement

200. A 9-year-old has moderate caries and extreme anxiety stemming from a previous negative dental experience. Parents and child express desire for a full resolution in one visit. The pediatric dentist, after trying nonpharmacological methods and nitrous oxide without success, recommends outpatient general anesthesia at a specialized center. What is the MOST compelling rationale for this recommendation?
(A) To give the dentist more personal time off
(B) To completely bypass any behavior shaping
(C) To address all treatment needs safely under controlled sedation, reducing trauma and ensuring efficiency
(D) Because general anesthesia is cheaper than other methods

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CHAPTER 05

PERIODONTOLOGY

1. Which of the following best describes gingival enlargement?
   (A) Overgrowth limited to the alveolar mucosa
   (B) Inflammatory swelling affecting only the free gingiva
   (C) Increase in gingival size involving marginal and interdental areas
   (D) Localized edematous change confined to the papillary region

2. Which microorganism is most commonly implicated in plaque-induced chronic gingivitis?
   (A) Aggregatibacter actinomycetemcomitans
   (B) Porphyromonas gingivalis
   (C) Fusobacterium nucleatum
   (D) Streptococcus mutans

3. In the pathogenesis of gingivitis, which of the following events typically occurs first?
   (A) Connective tissue attachment loss
   (B) Pocket formation and bone loss
   (C) Initial endothelial changes and increased vascular permeability
   (D) Apical migration of the junctional epithelium

4. All of the following are clinical signs of chronic gingivitis except:
   (A) Bleeding on probing
   (B) Periodontal pocket formation exceeding 5 mm
   (C) Gingival redness and swelling
   (D) Altered gingival contour or shape

5. How does acute gingivitis differ from chronic gingivitis?
   (A) Acute gingivitis presents with fibrotic tissues, while chronic gingivitis shows bright red tissues
   (B) Acute gingivitis typically has a sudden onset and pronounced symptoms, while chronic gingivitis develops more slowly
   (C) Acute gingivitis is usually painless, whereas chronic gingivitis often causes severe pain
   (D) Acute gingivitis demonstrates significant bone loss, whereas chronic gingivitis does not

6. Which of the following is the best initial management step for chronic plaque-induced gingivitis?
   (A) Systemic antibiotics
   (B) Chlorhexidine mouth rinse alone
   (C) Professional scaling and patient education on oral hygiene
   (D) Gingivoplasty

7. A 28-year-old patient presents with mild chronic gingivitis. Which daily intervention is most critical for preventing disease progression?
   (A) Rinsing with a fluoride mouthwash twice a day
   (B) Flossing combined with appropriate toothbrushing technique
   (C) Regular consumption of green tea
   (D) Using an interdental brush once a week

8. Which clinical feature most characterizes the transition from gingivitis to periodontitis?
   (A) Ulceration of the gingival epithelium
   (B) Collagen fiber disorganization in the connective tissue
   (C) Attachment loss and periodontal pocket formation
   (D) Redness extending to the alveolar mucosa

9. When educating a patient on brushing technique to manage gingivitis, all steps are correct except:
   (A) Use a soft-bristled brush angled at 45 degrees to the gingival margin
   (B) Employ gentle, circular strokes along the gum line
   (C) Push the bristles forcefully until slight tissue bleeding occurs
   (D) Brush the occlusal surfaces in a back-and-forth motion

10. What is the primary reason that inadequate oral hygiene leads to gingival inflammation?
   (A) Excessive saliva production accumulates around the gingiva
   (B) Hard deposits of supra- and subgingival calculus compress the gingiva
   (C) Plaque biofilm harbors bacteria and endotoxins that trigger inflammatory reactions
   (D) Impaired clotting factors promote micro-hemorrhages in gingival tissue

11. A 35-year-old smoker with poor plaque control reports painless bleeding gums and mild halitosis. Examination shows generalized erythematous margins with no clinical attachment loss. What is the most likely diagnosis?
   (A) Periodontitis
   (B) Chronic gingivitis
   (C) Necrotizing ulcerative gingivitis
   (D) Periodontal abscess

12. A 26-year-old patient has inflamed, bulbous interdental papillae that bleed readily on probing. Which is the most likely clinical diagnosis?
   (A) Localized periodontitis
   (B) Chronic marginal gingivitis
   (C) Gingival recession
   (D) Pericoronitis

13. A patient with chronic gingivitis has a history of suboptimal brushing. What is the first professional intervention to address this condition effectively?
   (A) Gingivectomy to remove excess tissue
   (B) Prescribing topical corticosteroids
   (C) Supragingival and subgingival scaling combined with oral hygiene instruction
   (D) Extraction of affected teeth

14. According to standard clinical guidelines, how often should a patient with stable chronic gingivitis receive professional prophylaxis?
   (A) Every 2 weeks
   (B) Every 3 to 4 months
   (C) Once a year
   (D) Only when the patient reports symptoms

15. Which sign in a patient presumed to have gingivitis might prompt investigation for an underlying systemic condition?
   (A) Localized redness around one tooth
   (B) Mild edema resolving with improved brushing
   (C) Spontaneous bleeding with minimal plaque
   (D) Gingival margin lightly shaped

16. Assertion (A): Chronic gingivitis can persist for years without progressing to periodontitis.
   Reason (R): Periodontitis requires bacterial infiltration into the deeper supporting structures of the tooth.
   (A) Both A and R are true, and R is the correct explanation for A
   (B) Both A and R are true, but R is not the correct explanation for A
   (C) A is true, R is false
   (D) A is false, R is true

17. Which factor is most crucial in the maintenance phase for a patient treated for chronic gingivitis?
   (A) Routine prescription of antimicrobials
   (B) Frequent rinsing with saline solution
   (C) Regular periodontal check-ups and reinforcement of plaque control measures
   (D) Obtaining genetic testing for susceptibility

18. Which diagnostic step helps distinguish chronic gingivitis from early periodontitis?
   (A) Checking tooth mobility
   (B) Evaluating plaque index alone

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(C) Assessing sulcus depth with a periodontal probe
(D) Performing vitality tests on affected teeth

19. A 24-year-old experiences bleeding gums and mild pain for one week. Examination shows localized edematous gingiva around anterior teeth without bone loss. Which primary factor initiates this gingival condition?
(A) Host genetic factors
(B) Medications causing hyperplasia
(C) Bacterial plaque accumulation
(D) Autoimmune processes

20. A 30-year-old with chronic marginal gingivitis has a 3-year history of smoking one pack daily. Clinical findings show edematous but minimally bleeding gingiva, mild halitosis, and calculus buildup. Outline the first essential step in managing this chronic condition.
(A) Full-mouth periodontal surgery
(B) Smoking cessation advice and improved plaque control
(C) Antibiotic therapy
(D) Gingivoplasty procedures

21. Why might gingival tissues in chronic gingivitis appear fibrotic rather than edematous over time?
(A) The gingiva undergoes atrophy, becoming firm
(B) Repeated inflammation leads to collagen breakdown without repair
(C) The tissue undergoes reparative fibrosis in response to longstanding low-grade inflammation
(D) Local anesthetic infiltration permanently changes tissue texture

22. Which statement best defines acute necrotizing ulcerative gingivitis (ANUG)?
(A) A chronic, painless gingival swelling with fibrous overgrowth
(B) A viral-induced gingival infection causing distinct vesicles
(C) A painful, ulcerative gingival condition often associated with fusiform bacteria and spirochetes
(D) A localized gingival recession caused by mechanical trauma

23. Which is the most common etiological factor in gingival enlargement related to medication?
(A) Antibiotics
(B) Anticonvulsants
(C) Proton pump inhibitors
(D) Narcotic analgesics

24. Why does chronic plaque accumulation commonly result in gingival enlargement?
(A) Plaque biofilm stimulates fibroblasts to deposit excess collagen
(B) Circulating antibodies encourage gingival tissue atrophy
(C) Subgingival calculus exerts direct compressive forces causing tissue hypertrophy
(D) Cholesterol crystals accumulate in the gingival sulcus

25. All of the following are manifestations of drug-induced gingival enlargement except:
(A) Fibrotic, nodular appearance of the interdental papillae
(B) Rapid onset of bleeding necrotic ulcerations
(C) Extension of enlarged tissue over the crowns of teeth
(D) Difficulty in maintaining adequate oral hygiene

26. How does hereditary gingival fibromatosis differ from medication-induced gingival enlargement?
(A) Hereditary fibromatosis exclusively affects posterior teeth
(B) Medication-induced enlargement always resolves spontaneously when drug use ceases
(C) Hereditary fibromatosis is genetically determined and can appear in the absence of external triggers
(D) Medication-induced changes involve only collagen, while hereditary fibromatosis affects only epithelium

27. Which is the best treatment approach for chronic inflammatory gingival enlargement caused by plaque accumulation?
(A) Immediate gingivectomy without considering oral hygiene
(B) Supragingival scaling, root planing, and strict oral hygiene reinforcement
(C) Frequent antibiotic prophylaxis
(D) Extraction of the involved teeth

28. A 40-year-old presenting with generalized gingival overgrowth is found to be on amlodipine for hypertension. Which immediate action may help manage this enlargement?
(A) Halting all antihypertensive medications
(B) Liaising with the physician to consider an alternative drug
(C) Performing immediate surgical recontouring
(D) Switching the patient to insulin therapy

29. Following nonsurgical periodontal therapy for gingival enlargement, the next best step if tissues remain overgrown and inflamed is:
(A) Continue only with mouth rinses
(B) Move directly to antibiotic coverage
(C) Perform gingivoplasty or gingivectomy
(D) Extract all severely affected teeth

30. A distinguishing clinical sign of fibrotic gingival enlargement (versus edematous enlargement) is:
(A) Soft, spongy consistency
(B) Highly vascular tissue with surface bleeding
(C) Firm, resilient texture with a pale pink color
(D) Bluish discoloration of gingival margins

31. A 34-year-old patient complains of gum swelling after starting cyclosporine therapy post-kidney transplant. Examination reveals generalized fibrotic enlargements around both anterior and posterior teeth. The patient reports difficulty brushing effectively. Which course of action is most critical for preventing further enlargement?
(A) Scaling and root planing
(B) Surgical recontouring alone
(C) Changing immunosuppressant immediately without consultation
(D) Topical steroid application

32. Why does plaque-induced gingival enlargement commonly lead to pseudopocket formation?
(A) The bony support beneath the gingiva is destroyed
(B) Tissue swelling extends coronally, creating deeper sulci
(C) The teeth shift position due to alveolar bone growth
(D) The periodontal ligament thickens, pushing gingiva coronally

33. A 29-year-old complains of swollen, painful gums around newly erupted third molars. Examination reveals inflamed operculum with localized edema and occasional exudate. Which condition best describes these symptoms?
(A) Gingivitis
(B) Periodontal abscess
(C) Pericoronitis
(D) Necrotizing ulcerative periodontitis

34. A patient reports occasional bleeding and mild pain from the gum flap on the distal side of a partially erupted third molar. Which diagnostic term applies?
(A) Periodontitis around third molar
(B) Pericoronitis
(C) Periodontal abscess
(D) Drug-induced gingival overgrowth

35. What is the most appropriate initial management for acute pericoronitis with localized inflammation and mild trismus?
(A) Immediate removal of the partially erupted tooth
(B) Systemic antibiotics without any local measures
(C) Irrigation under the operculum and improved oral hygiene
(D) Gingivectomy over the operculum on the first visit

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36. According to standard treatment guidelines, which scenario most strongly indicates the need for operculectomy in pericoronitis?
(A) Mild inflammation that resolves with improved hygiene
(B) Recurrent pericoronitis episodes despite conservative therapy
(C) First-time acute pericoronitis presentation
(D) Lack of any symptoms but noticeable operculum

37. A 45-year-old with a swollen gingival flap over a partially erupted molar also exhibits severe facial swelling and fever. What severe complication must be ruled out?
(A) Sinusitis
(B) Ludwig's Angina
(C) Periodontal cyst formation
(D) Oral lichen planus

38. What key clinical symptom often differentiates pericoronitis from generalized gingivitis?
(A) Diffuse bleeding on probing
(B) Localized pain around a partially erupted tooth
(C) Fibrotic gingival enlargement
(D) Malodor without pain

39. Assertion (A): Chronic pericoronitis can lead to periodontal pocket formation distal to the partially erupted tooth.
Reason (R): Chronic inflammation can cause destruction of the periodontal attachment and alveolar bone if not addressed.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, R is false
(D) A is false, R is true

40. Which management step is crucial if a patient's pericoronitis signs fail to improve after standard conservative measures?
(A) Mandibular nerve resection
(B) Extraction of the involved tooth if non-functional or poorly positioned
(C) Strict bed rest and analgesics only
(D) Use of muscle relaxants to prevent trismus

41. Which radiographic view is commonly used to assess third molar positioning in pericoronitis cases?
(A) Periapical radiograph of the anterior region
(B) Bitewing radiograph
(C) Occlusal radiograph of the maxilla
(D) Panoramic radiograph (Orthopantomogram)

42. A 21-year-old college student complains of gum pain near an erupting mandibular third molar. Examination shows mild trismus, swollen operculum, and no systemic symptoms. What immediate intervention is appropriate?
(A) Surgical extraction
(B) Gentle irrigation of the operculum area
(C) High-dose corticosteroids
(D) Full mouth prophylaxis

43. A 27-year-old with recurring pericoronitis affecting the mandibular right third molar has undergone repeated treatments of irrigation and antibiotics. Radiographs reveal a mesioangular impaction. The tooth is non-functional and frequently traps debris. What definitive treatment is indicated?
(A) Continued irrigation and observation
(B) Gingivoplasty of the operculum only
(C) Extraction of the impacted third molar
(D) Regular antibiotic prophylaxis

44. Which immunological component primarily mediates the gingival inflammatory response in plaque-induced gingivitis?
(A) IgE-mediated hypersensitivity
(B) T-cell dominated cellular response with cytokine release
(C) Autoimmune antibody production directed against fibroblasts
(D) Complement system activation in the absence of bacteria

45. Which term best describes the reversible gingival inflammation without loss of supporting periodontal structures?
(A) Periodontitis
(B) Gingivitis
(C) Periodontal abscess
(D) Papillitis

46. Which index is widely used to measure gingival inflammation?
(A) DMFT index
(B) Russell's Periodontal Index
(C) Gingival Index (Löe and Silness)
(D) Simplified Oral Hygiene Index

47. Why is it essential to differentiate between plaque-induced gingivitis and non-plaque-induced gingival lesions?
(A) Non-plaque-induced lesions are more common
(B) Plaque-induced gingivitis typically requires tooth extraction
(C) Non-plaque-induced lesions may need different treatment approaches, such as systemic therapy
(D) Plaque-induced gingivitis rarely responds to conventional scaling

48. All of the following are potential systemic risk factors for plaque-induced gingivitis except:
(A) Poorly controlled diabetes mellitus
(B) Stress and smoking
(C) Hypertension without medication
(D) Hormonal changes (puberty, pregnancy)

49. How does gingivitis due to hormonal fluctuations (e.g., pregnancy gingivitis) differ from chronic plaque-induced gingivitis?
(A) Hormonal gingivitis typically lacks plaque altogether
(B) Hormonal gingivitis exhibits more pronounced inflammation with minimal plaque
(C) Chronic plaque-induced gingivitis causes no bleeding
(D) Hormonal gingivitis leads to alveolar bone loss

50. A pregnant patient presents with swollen, bleeding gums despite good oral hygiene. Which intervention is most appropriate to manage pregnancy gingivitis?
(A) Postpone all dental care until after delivery
(B) Instruct thorough plaque control and consider more frequent dental cleanings
(C) Prescribe routine antibiotic prophylaxis
(D) Immediately perform surgical excision of inflamed gingiva

51. Which of the following best defines aggressive periodontitis?
(A) A slowly progressing periodontal condition prevalent in older adults
(B) Rapid attachment loss and bone destruction in clinically healthy patients
(C) A disease limited only to soft tissue inflammation without bone loss
(D) A condition characterized by constant, generalized plaque deposits

52. Which bacterial species is most commonly associated with aggressive periodontitis?
(A) Porphyromonas gingivalis
(B) Treponema denticola
(C) Aggregatibacter actinomycetemcomitans
(D) Fusobacterium nucleatum

53. In aggressive periodontitis, why does the rate of bone loss often exceed that observed in chronic periodontitis?
(A) Patients typically have excellent oral hygiene
(B) The condition is restricted to one tooth
(C) A heightened immune-inflammatory response occurs in genetically predisposed individuals
(D) Bone metabolism is unaffected by bacterial load

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54. All of the following are characteristic features of localized aggressive periodontitis except:
(A) Rapid attachment loss around first molars and incisors
(B) Onset around puberty
(C) High amounts of visible plaque in all affected sites
(D) Familial aggregation

55. What key difference distinguishes generalized aggressive periodontitis from localized aggressive periodontitis?
(A) Generalized form affects only one or two teeth
(B) Localized form shows no familial trends
(C) Generalized form involves at least three permanent teeth other than first molars and incisors
(D) Localized form occurs exclusively in edentulous adults

56. Which of the following interventions is most appropriate as an adjunct therapy in managing localized aggressive periodontitis?
(A) High-dose corticosteroids for two weeks
(B) Extraction of all first molars and incisors
(C) Local or systemic antimicrobial therapy after debridement
(D) Gingivoplasty for aesthetic contouring

57. A 19-year-old patient presents with severe bone loss around incisors and first molars, minimal plaque, and a family history of early tooth loss. What immediate step should be taken following basic scaling?
(A) Systemic antibiotic therapy in combination with root planing
(B) Regular fluoride applications
(C) Gingivectomy of enlarged gingiva
(D) Use of antiseptic mouthwash alone

58. Which clinical sign is most suggestive of localized aggressive periodontitis in an adolescent?
(A) Diffuse gingival redness with no radiographic changes
(B) Rapid vertical bone loss around permanent first molars
(C) Widespread calculus deposits and mild gingival recession
(D) Bleeding on probing in all posterior teeth but minimal bone loss

59. In managing aggressive periodontitis, which of the following strategies is least appropriate?
(A) Systemic antibiotic regimen
(B) Frequent periodontal maintenance visits
(C) Use of microbial testing for targeted therapy
(D) Relying solely on thorough home brushing to halt rapid bone loss

60. Why might patients with aggressive periodontitis exhibit more rapid bone destruction than expected for their age?
(A) They have strictly supra-gingival calculus
(B) Their alveolar bone is denser, making it collapse faster
(C) Dysregulated host defense leads to excessive inflammation and collagen breakdown
(D) Gingivitis onset triggers immediate bone formation that later collapses

61. A 15-year-old with minimal plaque complains of tooth mobility in first molars. Radiographs show vertical bony defects, and the patient's mother has similar history. What condition is most likely?
(A) Chronic periodontitis
(B) Localized aggressive periodontitis
(C) Necrotizing ulcerative periodontitis
(D) Gingivitis

62. A 25-year-old shows rapid generalized bone loss around multiple teeth, including premolars and second molars, with minimal plaque. Which is the most likely diagnosis?
(A) Localized aggressive periodontitis
(B) Generalized aggressive periodontitis
(C) Chronic marginal gingivitis
(D) Pericoronitis

63. Which clinical measure is critical immediately after initial debridement in a generalized aggressive periodontitis case?
(A) Root amputation of multi-rooted teeth
(B) Periodontal maintenance every 2-3 months
(C) Switching the patient to a liquid diet
(D) Extraction of all posterior teeth

64. Based on accepted guidelines, which family-related step is advisable after diagnosing a patient with localized aggressive periodontitis?
(A) Immediate extraction of all family members' first molars
(B) Genetic counseling or screening for siblings and close relatives
(C) Prohibiting family members from using the same utensils
(D) Instituting a vegetarian diet for the entire family

65. A 20-year-old with signs of rapid periodontitis and neutrophil dysfunction also exhibits frequent skin and systemic infections. Which broader condition might be considered in the differential diagnosis?
(A) Local tissue trauma
(B) Chronic stress
(C) Papillon-Lefèvre syndrome
(D) Pregnancy gingivitis

66. Assertion (A): Aggressive periodontitis often exhibits familial clustering.
Reason (R): Genetic predisposition can impair host immune responses, intensifying periodontal destruction.
(A) Both A and R are true, and R explains A
(B) Both A and R are true, but R does not explain A
(C) A is true, R is false
(D) A is false, R is true

67. In a case of localized aggressive periodontitis not responding to standard scaling and antibiotics, which additional therapy might be considered?
(A) Topical fluoride trays
(B) Repeated high-dose corticosteroids
(C) Surgical debridement and bone grafting in severe defects
(D) Full-arch extractions

68. Which diagnostic test can help identify specific microorganisms implicated in aggressive periodontitis?
(A) Salivary flow test
(B) Cone-beam computed tomography (CBCT)
(C) Microbial culture or polymerase chain reaction (PCR) analysis
(D) Serum glucose level check

69. A 22-year-old experiences rapid interdental bone loss, especially around anterior teeth. Plaque is minimal. Mother lost teeth early. Which lab test would help confirm a specific bacterial involvement?
(A) Complete blood count
(B) PCR for Aggregatibacter actinomycetemcomitans
(C) Blood lipid profile
(D) Urinalysis

70. A 26-year-old notes increasing tooth mobility and gum recession despite meticulous home care. Examination confirms localized aggressive periodontitis around first molars and incisors. Family history reveals similar problems. Radiographs show vertical bone defects. Outline the crucial components of therapy.
(A) Full-arch extractions
(B) Antimicrobial therapy with mechanical debridement
(C) Gingivoplasty alone
(D) Periodontal splinting without antibiotics

71. Which statement best characterizes necrotizing ulcerative gingivitis (NUG)?
(A) A painless, chronic gingival overgrowth
(B) An acute infection causing painful, ulcerated papillae with a "cratered" appearance
(C) A hyperplastic condition triggered by medication
(D) A mild gingivitis resolving spontaneously without treatment

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72. Which microorganism is often linked with necrotizing ulcerative gingivitis?
(A) Aggregatibacter actinomycetemcomitans
(B) Prevotella intermedia
(C) Candida albicans
(D) Actinomyces israelii

73. Why is necrotizing ulcerative gingivitis often accompanied by intense pain and foul odor?
(A) It is an autoimmune condition causing fibrotic growth
(B) Tissue necrosis fosters the growth of anaerobic bacteria and spirochetes
(C) It involves alveolar bone deposition
(D) The disease is odorless and painless

74. All are clinical features of necrotizing ulcerative gingivitis (NUG) except:
(A) Punched-out papillae
(B) Profuse bleeding
(C) Fibrotic gingival overgrowth
(D) Severe pain and halitosis

75. How does necrotizing ulcerative periodontitis (NUP) differ from necrotizing ulcerative gingivitis (NUG)?
(A) NUG involves bone destruction, whereas NUP spares bone
(B) NUP extends to deeper periodontal structures, causing attachment loss and bone necrosis
(C) NUP is painless and never progresses to systemic involvement
(D) NUG occurs only in fully edentulous patients

76. Which initial treatment is most appropriate for a patient with acute necrotizing ulcerative gingivitis?
(A) Immediate systemic antibiotics without debridement
(B) Gentle debridement of necrotic areas, antimicrobial rinse, and pain management
(C) Surgical excision of all necrotic gingiva
(D) Extraction of involved teeth

77. A college student under intense exam stress presents with cratered gingival papillae, pain, and severe halitosis. Which self-care measure should be advised alongside professional debridement?
(A) Avoid toothbrushing near painful areas
(B) Use warm saline or chlorhexidine mouth rinses to reduce bacterial load
(C) Switch to a liquid diet for the duration of the infection
(D) Apply topical steroids multiple times daily

78. Which symptom or clinical sign indicates necrotizing ulcerative gingivitis is progressing to necrotizing ulcerative periodontitis?
(A) Bleeding on probing limited to gingival tips
(B) Formation of pseudopockets from gingival swelling
(C) Necrosis extending beyond gingiva into periodontal ligament and alveolar bone
(D) Fibrotic tissue replacing ulcerated gingiva

79. In the acute management of NUG, which step is not recommended?
(A) Gentle removal of pseudomembrane and necrotic tissue
(B) Prescribing analgesics for pain control
(C) Advising the patient to discontinue brushing to reduce irritation
(D) Chlorhexidine mouthwash twice daily

80. Why do individuals under high psychosocial stress risk developing necrotizing ulcerative gingivitis?
(A) Stress triggers tooth hypereruption
(B) Heightened salivary flow dilutes antimicrobial peptides
(C) Compromised immune response and reduced self-care lead to bacterial overgrowth
(D) Stress kills all oral bacteria, making tissues vulnerable

81. A 28-year-old smoker presents with ulcerated interdental papillae and severe pain. Examination reveals crater-like lesions and pseudomembranes. Which immediate professional action is warranted?
(A) Full-thickness flap surgery
(B) Gentle removal of necrotic tissue

(C) Tooth extraction
(D) Gingivectomy

82. A patient complains of extreme pain, bleeding gums, and fetid odor. On examination, papillary necrosis with a grayish pseudomembrane is evident. Which is the most likely diagnosis?
(A) Chronic periodontitis
(B) Necrotizing ulcerative gingivitis (NUG)
(C) Pericoronitis
(D) Gingival overgrowth due to medication

83. For a patient with NUG and systemic involvement (fever, malaise), which additional measure is appropriate besides local debridement?
(A) High-dose IV steroids
(B) Systemic antibiotics targeting anaerobes and spirochetes
(C) Extraction of all teeth with papillary necrosis
(D) Immediate gingivoplasty for esthetics

84. According to widely accepted clinical protocols, which behavior modification should accompany treatment for necrotizing ulcerative gingivitis?
(A) Reducing or quitting smoking
(B) Avoiding toothbrushing for two weeks
(C) Only using mouthwash without scaling
(D) Following a high-sugar diet to enhance healing

85. In a severely immunocompromised patient with necrotic oral lesions, which possibility besides NUG must be considered?
(A) Gingival pigmentation changes
(B) Aphthous stomatitis
(C) Mucormycosis or other deep fungal infection
(D) Traumatic ulcer from a toothbrush

86. Which hallmark clinical sign strongly supports a diagnosis of necrotizing ulcerative gingivitis in a patient complaining of gum pain?
(A) Bright pink fibrotic gingiva
(B) Slight edema without ulceration
(C) "Punched-out" interdental papillae with pseudomembranous covering
(D) Deep periodontal pockets with minimal bleeding

87. Assertion (A): Necrotizing periodontal diseases can progress rapidly, causing severe tissue destruction.
Reason (R): Poor oral hygiene alone is sufficient to cause all cases of necrotizing periodontal conditions.
(A) Both A and R are true, and R correctly explains A
(B) Both A and R are true, but R does not explain A
(C) A is true, R is false
(D) A is false, R is true

88. Which measure is typically employed during follow-up appointments for necrotizing ulcerative gingivitis once acute symptoms subside?
(A) Surgical excision of interdental papillae
(B) Reinforcement of oral hygiene and removal of residual calculus
(C) Routine prophylactic antibiotic therapy for every recall
(D) Delaying further care for six months

89. Which clinical or laboratory finding would prompt an investigation beyond NUG to rule out a possible systemic immunodeficiency?
(A) Rapid resolution of ulcers with debridement
(B) Localized gingival bleeding but rapid healing
(C) Non-resolving necrotic lesions and unexplained weight loss
(D) Papillary recession confined to anterior teeth

90. A 32-year-old smoker with irregular oral hygiene presents with necrotic papillae, severe gingival pain, and halitosis for 1 week. Examination reveals pseudomembrane formation and spontaneous bleeding. After gentle debridement and chlorhexidine rinse, which additional step is crucial if fever and lymphadenopathy are observed?
(A) Antifungal therapy
(B) Systemic antibiotic course
(C) Gingivectomy
(D) Extraction of necrotic papillae

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91. A 40-year-old patient presents with acute pain and localized swelling in the gingiva near a previously treated periodontal pocket. Examination reveals pus discharge on probing. Radiograph shows slight alveolar bone loss. Which diagnosis is most probable?
(A) Gingival abscess
(B) Periodontal abscess
(C) Pericoronitis
(D) Endodontic abscess

92. Which statement best defines a gingival abscess?
(A) A localized purulent infection in the mucosa of the cheek
(B) A superficial collection of pus limited to the marginal gingiva or interdental papilla
(C) A deep infection involving the periodontal ligament
(D) A necrotic condition restricted to alveolar bone

93. Which clinical sign commonly indicates a periodontal abscess rather than a gingival abscess?
(A) Swelling restricted to the marginal gingiva
(B) Radiographic evidence of a deep periodontal pocket
(C) A foreign body visible in the interdental papilla
(D) No evidence of prior periodontitis

94. Why can incomplete removal of subgingival calculus lead to a periodontal abscess?
(A) Calculus physically supports the tooth structure, preventing abscess formation
(B) Subgingival calculus stimulates rapid bone regeneration
(C) Retained calculus harbors bacteria, causing acute flare-ups in periodontal pockets
(D) It triggers immediate fibrotic healing around the tooth

95. All of the following steps are recommended in treating a gingival or periodontal abscess except:
(A) Drainage of pus
(B) Systemic antibiotics for every simple, small abscess
(C) Mechanical debridement of the affected area
(D) Relief of any occlusal trauma, if present

96. How does a periodontal abscess generally differ from an endodontic abscess in terms of location?
(A) A periodontal abscess arises from apical tissue, while an endodontic abscess starts in the gingival papilla
(B) A periodontal abscess is associated with a periodontal pocket, whereas an endodontic abscess originates from pulp infection
(C) An endodontic abscess always appears on the buccal gingiva, while a periodontal abscess remains lingual
(D) They are indistinguishable clinically and radiographically

97. A 45-year-old patient with chronic periodontitis reports severe localized swelling and pain in a deep pocket. Which immediate treatment step is best?
(A) Prescribing mouth rinses only
(B) Drain the abscess and thoroughly debride the pocket
(C) Extraction of the tooth
(D) Full-arch flap surgery

98. A patient presents with a localized gingival swelling after accidentally lodging a popcorn kernel fragment. Which measure best addresses a superficial gingival abscess?
(A) Full mouth quadrant-wise flap surgery
(B) Dislodging the foreign body and draining pus if present
(C) Prescribing indefinite antibiotic therapy
(D) Completely ignoring the area for spontaneous resolution

99. Which clinical sign best indicates that a gingival abscess has been successfully managed?
(A) Persistent pus discharge
(B) Continued throbbing pain
(C) Resolution of swelling and disappearance of sinus tract
(D) Increasing mobility of the involved tooth

100. In managing a periodontal abscess, which action is incorrect?
(A) Performing gentle probing to drain exudate
(B) Adjusting occlusion if excessive forces aggravate the area
(C) Immediate extraction of all teeth with deep pockets
(D) Considering adjunct antibiotics if systemic signs occur

101. Which statement best defines a periodontal splint?
(A) A fixed or removable wire used only for orthodontic correction
(B) A device that binds loose teeth together to stabilize them and distribute occlusal forces
(C) A plastic mouthguard worn primarily for sports protection
(D) An intraoral appliance that serves as a bite raiser to reduce TMJ stress

102. Which primary clinical sign often indicates the need for a periodontal splint?
(A) Bleeding on probing only
(B) Shallow periodontal pockets around all teeth
(C) Pathological tooth mobility causing patient discomfort
(D) Excessive supragingival calculus

103. Why might splinting be beneficial for periodontally compromised teeth during the healing phase of periodontal therapy?
(A) It completely restores lost alveolar bone
(B) It regenerates cementum on root surfaces
(C) It reduces functional trauma by distributing bite forces, allowing tissues to heal
(D) It lengthens the clinical crown for aesthetic reasons

104. All of the following are indications for periodontal splinting except:
(A) Severe tooth mobility affecting mastication
(B) Stabilizing teeth during periodontal regeneration procedures
(C) Minimal mobility confined to only one anterior tooth with no patient discomfort
(D) Post-orthodontic stabilization for periodontally compromised teeth

105. How does an extracoronal splint differ from an intracoronal splint?
(A) Intracoronal splints wrap around the labial surfaces, while extracoronal splints fit inside the pulp chamber
(B) Extracoronal splints bond to the external enamel surface, whereas intracoronal splints involve a prepared channel inside the tooth
(C) Only extracoronal splints can be removed by the patient
(D) Intracoronal splints are used exclusively for posterior teeth

106. A patient with moderate bone loss and marked mobility in the mandibular anterior segment complains of difficulty chewing. Which intervention best addresses immediate stabilization?
(A) Extract all mobile teeth
(B) Provide a fiber-reinforced composite splint on the lingual surfaces
(C) Recommend daily chlorhexidine rinses only
(D) Perform a free gingival graft

107. A 52-year-old is undergoing nonsurgical periodontal therapy but struggles with mobility in the anterior maxilla, impacting speech. Which immediate strategy is most likely to improve stability and function?
(A) Fabrication of a removable acrylic splint or bite guard
(B) Gingivectomy around the mobile teeth
(C) Prescribing antibiotics for one month
(D) Strictly using an antiseptic mouthwash twice daily

108. Which clinical feature suggests that splint removal might be considered after some healing?
(A) Increased bleeding on probing
(B) Significant improvement in tooth mobility and stable periodontal attachment
(C) Formation of gingival recession around the splint
(D) Persistent pain in the splinted segment

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109. When placing a bonded (extracoronal) splint for mobile anterior teeth, which step is incorrect?
(A) Roughening and etching the lingual surfaces
(B) Applying a bonding agent and resin material
(C) Leaving large overhangs of composite to reinforce the splint's strength
(D) Checking occlusion to ensure no heavy contacts on the splint

110. Given proper oral hygiene and stable splinting, what is the likelihood that tooth mobility will decrease over time in periodontally treated patients?
(A) Almost none, mobility never decreases once established
(B) Low, unless they undergo orthodontic treatment
(C) Moderate to high, if inflammation is controlled and supportive tissues have time to repair
(D) Guaranteed immediate resolution of all mobility

111. Why does splinting reduce the risk of secondary occlusal trauma in patients with reduced periodontal support?
(A) It moves teeth into ideal alignment
(B) It prevents bacterial colonization on root surfaces
(C) By uniting multiple teeth, it disperses occlusal forces and lessens stress on each supporting structure
(D) It eliminates the need for oral hygiene measures

112. A 37-year-old patient complains of mobility in her lower incisors post-scaling therapy. Radiographs show moderate bone loss. She has minimal discomfort but struggles to bite into food. What initial splinting approach is ideal?
(A) Lingual bonded composite splint
(B) Extraction of all affected incisors
(C) Prescription of antibiotics
(D) Crown lengthening

113. A patient with mild TMJ discomfort and mobile upper incisors shows occlusal wear facets and a habit of clenching. Which additional diagnosis might warrant a stabilization splint that also helps the TMJ?
(A) Caries infiltrating the pulp chamber
(B) Temporomandibular joint disorder related to bruxism
(C) Oral squamous cell carcinoma
(D) Aphthous ulcers triggered by stress

114. After periodontally compromised lower anteriors are splinted, which professional follow-up is most critical to ensure long-term success?
(A) Radiographic evaluation for root fractures every two weeks
(B) Occlusal adjustment and regular scaling at recommended intervals
(C) Switching to a soft diet permanently
(D) Immediate removal of the splint after one month

115. According to standard periodontal guidelines, in which scenario is long-term splinting most recommended?
(A) When only gingivitis is present without attachment loss
(B) Teeth with advanced attachment loss but salvageable support, requiring functional stability
(C) During the first year of orthodontic treatment with no periodontal involvement
(D) For an entirely edentulous patient

116. A 60-year-old wearing a splint for six months experiences renewed mobility and discomfort. What red flag condition should be ruled out before adjusting the splint?
(A) Recurrent caries in a non-existent crown margin
(B) A local fungal infection on the tongue
(C) Progressive periodontal breakdown or vertical root fracture
(D) Allergic stomatitis only on the attached gingiva

117. What key symptom often prompts a patient to request splinting of their mobile teeth?
(A) Gingival recession alone
(B) Sensitivity to cold beverages in non-mobile teeth
(C) A "drifting" sensation or feeling that teeth are out of alignment when biting
(D) Mild halitosis with no mobility

118. Assertion (A): Splinting periodontally involved teeth can improve patient comfort during mastication.
Reason (R): Splinting regenerates significant lost alveolar bone in advanced periodontal disease.
(A) Both A and R are true, and R explains A
(B) Both A and R are true, but R does not explain A
(C) A is true, R is false
(D) A is false, R is true

119. In a patient with moderate mobility and acceptable oral hygiene, which follow-up practice best ensures successful splint maintenance?
(A) Advising minimal chewing to avoid damaging the splint
(B) Quarterly prophylaxis visits with regular adjustments or repairs of the splint
(C) Prescribing a high-fluoride gel daily
(D) Encouraging the patient to remove the fixed splint once a week

120. Which diagnostic method is most useful to confirm a suspicious vertical fracture in a splinted tooth causing renewed mobility?
(A) Regular periapical radiograph only
(B) Bitewing radiograph focusing on occlusal caries
(C) Cone-beam computed tomography (CBCT) for detailed 3D imaging
(D) Thermal sensitivity tests alone

121. A 55-year-old with multiple mobile lower incisors complains of difficulty brushing. He has moderate periodontitis and minimal pain. Which immediate approach best ensures stabilization and improved plaque control?
(A) Extracting the most mobile tooth
(B) Bonded lingual wire splint with hygiene instruction
(C) Gingivectomy for more attached gingiva
(D) Antibiotic prophylaxis for six months

122. A patient undergoing periodontal recall visits every three months has lower anteriors splinted for eight months. On examination, the splint remains intact, yet mild plaque accumulation is noted around the composite margins. The patient reports sporadic flossing. Which measure is critical to sustain periodontal stability around the splinted teeth?
(A) Reinforcing patient-specific oral hygiene techniques
(B) Early removal of the splint
(C) Switching to a full liquid diet
(D) Prescribing high-dose antibiotics

123. A 48-year-old patient with generalized chronic periodontitis underwent flap surgery in the anterior region. Due to moderate post-surgical mobility, a fiber-reinforced composite splint was placed. He complains of minor discomfort in biting. Describe the next clinical step.
(A) Occlusal adjustment and check for high points on the splint
(B) Immediate removal of the splint
(C) Initiate antibiotic therapy
(D) Localized gingivectomy around the splint

124. A 59-year-old presents with advanced periodontitis in the maxillary anterior segment, showing 50% bone loss and Grade II mobility of central incisors. After meticulous scaling and root planing, the patient notes difficulty biting into firm foods. Clinical examination reveals no acute infection. Radiographs confirm stable bone levels post-treatment. To protect against further trauma and enhance masticatory function, which intervention is recommended as part of ongoing periodontal care?
(A) Extraction of both incisors
(B) Intracoronal splint involving the incisors and canines
(C) Gingival curettage only
(D) Prolonged antibiotic course

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125. Assertion (A): Splinting teeth with reduced periodontal support may be combined with selective occlusal adjustment.
Reason (R): Eliminating excursive or protrusive interferences can further minimize traumatic forces on splinted teeth.
(A) Both A and R are true, and R explains A
(B) Both A and R are true, but R does not explain A
(C) A is true, R is false
(D) A is false, R is true

126. Which statement best describes periodontal flap surgery?
(A) A procedure exclusively for implant placement
(B) A surgery where gingival tissue is reflected to access roots and underlying bone
(C) A cosmetic operation to reshape lips in relation to teeth
(D) An extraction method for severely mobile teeth

127. Which incision design is commonly employed in modified Widman flap surgery?
(A) Inverse bevel incision
(B) Crestal incision only
(C) Vertical releasing incisions at every tooth
(D) No incision is used; lasers do all the cutting

128. Why might an osseous recontouring procedure accompany flap surgery in advanced periodontitis cases?
(A) To generate new alveolar bone around mobile teeth
(B) To reduce deep infrabony defects and create favorable bone contours for stable soft tissue attachment
(C) To eliminate the need for patient involvement in oral hygiene
(D) To camouflage dental caries at the crown margins

129. All of the following are goals of periodontal surgical procedures except:
(A) Improved access for debridement
(B) Regeneration of lost periodontal tissues
(C) Creation of deeper periodontal pockets for plaque retention
(D) Reduction of pocket depths to maintainable levels

130. How does a full-thickness flap differ from a split-thickness flap in periodontal surgery?
(A) A full-thickness flap includes the entire palatal tissue, while a split-thickness flap only uses buccal tissue
(B) A full-thickness flap involves reflecting gingiva and periosteum from the bone, whereas a split-thickness flap leaves periosteum intact
(C) A split-thickness flap always requires grafting, but a full-thickness flap does not
(D) Both flap types remove alveolar bone entirely

131. A patient presents with 6–8 mm pockets in the posterior mandible. Radiographs reveal angular bony defects. After scaling and root planing, pockets persist. Which surgical procedure is most appropriate for definitive management?
(A) Gingivectomy with no flap
(B) Apically positioned flap with osseous recontouring
(C) Full-mouth extractions
(D) Simple frenectomy

132. A 40-year-old patient with localized moderate periodontitis requires better access to remove subgingival calculus in a 7 mm pocket on the buccal side of a maxillary molar. Which surgical approach is most suitable?
(A) Simple curettage through the sulcus
(B) Full-thickness flap reflection on the buccal aspect
(C) Tongue tie release
(D) Extraction of the maxillary molar

133. Which key surgical step is essential in an apically positioned flap procedure?
(A) Placing the flap margin more coronally after suturing
(B) Using no sutures, letting the flap heal secondarily

(C) Suturing the flap margin at or near the alveolar crest to reduce pocket depth
(D) Leaving large tissue tags to aid in wound closure

134. In flap surgery for periodontal regeneration, which step is incorrect?
(A) Thorough debridement of root surfaces
(B) Placement of a regenerative material (e.g., bone graft or membrane)
(C) Placement of sutures ensuring no close adaptation of the flap margins
(D) Maintaining a stable, protective environment for healing

135. After successful flap surgery with bone grafting in an infrabony defect, what is the likelihood of achieving complete regeneration of the original bone height?
(A) Almost certain in all cases
(B) Very low without additional supportive therapies and excellent patient compliance
(C) Guaranteed if the defect is at least 10 mm deep
(D) Independent of patient's oral hygiene

136. Why does inadequate plaque control post-periodontal surgery often lead to suboptimal healing?
(A) Increased fibroblast proliferation
(B) Bacterial recolonization interrupts healing and perpetuates inflammation
(C) Faster bone formation blocks the clot
(D) The gingival margin shifts coronally spontaneously

137. A 42-year-old diabetic patient presents with 8 mm pockets in the mandible and infrabony defects. Despite improved glycemic control, scaling alone failed to reduce pockets. Which surgical procedure is most likely indicated?
(A) Gingivectomy
(B) Osseous surgery (flap with recontouring or regeneration)
(C) Immediate implant placement
(D) Palatal tissue graft

138. A patient's periodontal charting shows persistent deep pockets on the distal of a last molar with a history of pericoronitis and partial coverage by an operculum. Which surgical procedure could address both the periodontal pocket and the operculum?
(A) Operculectomy combined with distal wedge procedure
(B) Localized flapless implant placement
(C) Coronally advanced flap for coverage
(D) Lateral pedicle graft

139. Following apically positioned flap surgery in the maxillary anterior region, a patient complains of esthetic concerns about exposed root surfaces. Which management step is appropriate?
(A) Perform immediate crown lengthening of all anterior teeth
(B) Provide mucogingival grafting if the patient is stable and suitable for root coverage
(C) Instruct the patient to ignore the esthetics
(D) Prescribe antibiotics for one year

140. According to standard protocols, which postoperative instruction should be given to a patient after flap surgery with sutures placed?
(A) Only rinse vigorously to dislodge debris
(B) Return in 7–10 days for suture removal and professional evaluation
(C) Avoid all brushing for two weeks
(D) Substitute sugary drinks to promote healing

141. A patient complains of persistent pain and suppuration two weeks after osseous recontouring surgery. What red flag condition must be ruled out?
(A) Normal postoperative discomfort
(B) Inadequate plaque control leading to infection or bone sequestration
(C) Early alveolar bone regeneration
(D) Lack of any real surgical site

142. Which key symptom signals stable healing one week after periodontal flap surgery?
(A) Profuse bleeding at the surgical site
(B) No signs of acute inflammation, minimal swelling, and stable tissue margins

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(C) Pus discharge from the flap margins
(D) Severe throbbing pain radiating to the ear

143. Assertion (A): Flap surgeries can reduce pocket depths in periodontal disease.
Reason (R): Gain of clinical attachment occurs solely by flap closure without any regenerative material.
(A) Both A and R are true, and R explains A
(B) Both A and R are true, but R does not explain A
(C) A is true, R is false
(D) A is false, R is true

144. A patient experiences moderate bleeding through the dressing on day 2 post-flap surgery. Which management step is most appropriate?
(A) Instruct the patient to remove the dressing completely and rinse vigorously
(B) Have the patient compress the area gently with sterile gauze and contact the office if bleeding persists
(C) Schedule immediate re-suturing under general anesthesia
(D) Begin antibiotic therapy without examination

145. Which radiographic finding best indicates early positive healing after regenerative periodontal surgery in a vertical defect?
(A) No change in bone fill
(B) Slight increase in radiopacity at the defect site over several months
(C) Complete bone fill after one week
(D) Radiolucency expanding apically

146. A 35-year-old smoker with 6–7 mm pockets underwent a modified Widman flap. She returns at one week with mild swelling. Sutures are intact, no suppuration is observed. What immediate action is warranted?
(A) Remove sutures prematurely
(B) Confirm normal healing and advise continued gentle oral hygiene
(C) Re-open the flap to check bone
(D) Start broad-spectrum IV antibiotics

147. A 50-year-old patient with chronic periodontitis had an open-flap debridement around molars with furcation involvement. At the two-week follow-up, pocket depths remain reduced, but the patient complains of sensitivity to cold. Examination shows healthy, adapting gingival margins. Which conservative measure helps manage sensitivity while healing continues?
(A) Surgical re-entry
(B) Desensitizing agents or varnishes on exposed root surfaces
(C) Extraction of the molars
(D) Replacing sutures for another two weeks

148. A 45-year-old with deep infrabony defects on mandibular first molars underwent flap surgery with membrane placement for guided tissue regeneration. The patient returns at 6 weeks complaining of minimal discomfort. Radiographs show stable bone fill. Outline the likely next step.
(A) Membrane removal if indicated by the specific material's protocol
(B) Immediate second surgery for bone grafting
(C) Full crown coverage on all posterior teeth
(D) Discontinuation of all oral hygiene measures

149. A 58-year-old patient with generalized chronic periodontitis underwent quadrant-wise flap surgeries including osseous recontouring and occasional bone graft placement in localized defects. Three months postoperatively, periodontal probings show improved pocket depths from 7–8 mm to 3–4 mm in treated sites. The patient reports only slight sensitivity in areas of exposed root surfaces but expresses gratitude for the reduced mobility. Radiographs indicate stable alveolar contours. Which measure is essential to ensure long-term success of these surgical outcomes?
(A) Annual prophylaxis only
(B) Extraction of any tooth that was previously mobile
(C) Ongoing periodontal maintenance and meticulous home care
(D) Placing fixed bridges on all treated quadrants

150. Assertion (A): Regenerative periodontal surgery can restore some lost bone and attachment in specific defect configurations.
Reason (R): Horizontal bone loss always regrows spontaneously without surgical intervention.
(A) Both A and R are true, and R explains A
(B) Both A and R are true, but R does not explain A
(C) A is true, R is false
(D) A is false, R is true

151. Which of the following best describes crown lengthening?
(A) Removing alveolar bone apically to eliminate infrabony pockets
(B) Surgically exposing more tooth structure above the gingival margin
(C) Placing a graft material to cover exposed roots
(D) Extracting severely mobile teeth to increase crown space

152. Which step is typically involved in functional crown lengthening?
(A) Raising a flap and removing a minimal amount of bone to expose sound tooth structure
(B) Placing free gingival grafts to cover root surfaces
(C) Leaving the tooth in supra-occlusion for a month
(D) Filling the interdental papilla with antibiotic gel only

153. Why is preservation of the biologic width critical in crown lengthening procedures?
(A) It allows direct bonding of restorations onto alveolar bone
(B) It ensures adequate room for epithelial and connective tissue attachment, preventing chronic inflammation
(C) It prevents the need for any surgical flap reflection
(D) It always eliminates the need for prosthetic crowns

154. All of the following are indications for crown lengthening except:
(A) Subgingival caries or fractures close to the gingival margin
(B) Desire to improve aesthetics by reducing excessive gingival display
(C) Exposing root surfaces with no plan for a restorative margin
(D) Facilitating proper placement of crowns or restorations

155. How does esthetic crown lengthening differ from functional crown lengthening?
(A) Esthetic crown lengthening is always done on posterior teeth, whereas functional is for anteriors
(B) Functional crown lengthening involves removing more alveolar bone than esthetic procedures
(C) Esthetic procedures aim primarily to correct a "gummy smile," whereas functional procedures create adequate tooth structure for restorations
(D) Esthetic and functional crown lengthening are identical with no clinical distinctions

156. A 28-year-old patient with a "gummy smile" but healthy periodontium asks about reducing gingival display. Which surgical approach is most appropriate?
(A) Esthetic crown lengthening with a gingivectomy if needed
(B) Flapless immediate implant placement in the maxillary anterior region
(C) Extraction of maxillary anteriors
(D) Horizontal bone augmentation

157. A posterior tooth has subgingival decay extending close to the crest. The dentist needs 3 mm of tooth structure above the bone crest. Which procedure is indicated to provide space for a crown margin?
(A) Simple gingivoplasty without bone contouring
(B) Functional crown lengthening with apical flap positioning and osteoplasty

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(C) Orthodontic extrusion with no surgical intervention
(D) Frenectomy to reposition muscular attachments

158. What critical clinical measurement must be evaluated before performing crown lengthening?
(A) Attached gingiva thickness alone
(B) Sulcular fluid flow
(C) Biologic width—the distance from alveolar crest to gingival margin for adequate attachment
(D) Fremitus on adjacent teeth

159. Which of the following is incorrect when performing esthetic crown lengthening in the anterior region?
(A) Carefully evaluating smile line and gingival symmetry
(B) Resecting alveolar bone as needed to maintain biologic width
(C) Leaving the gingival margin at the same level as preoperative measurements
(D) Contouring gingival scallop to match adjacent teeth

160. After a properly executed crown lengthening, what is the likelihood of stable gingival margins if the patient maintains good oral hygiene?
(A) Very high—well-performed surgery with consistent plaque control often results in stable margins
(B) Minimal—regrowth of gingiva usually recovers the previous tissue height
(C) Impossible to predict—surgical outcome is random
(D) Dependent on a continuous antibiotic regimen for life

161. Why might noncompliance with postoperative oral hygiene lead to unsatisfactory results after crown lengthening?
(A) Bone rapidly overgrows the tooth
(B) Plaque accumulation leads to persistent inflammation, impeding healing and stable margin placement
(C) The restoration seats deeper into the alveolar socket
(D) Noncompliance instantly triggers nerve necrosis

162. A 41-year-old complains of recurring tooth fractures at the gum line. Examination shows insufficient coronal tooth structure for crowns. Biologic width is violated. Which primary surgical intervention is indicated?
(A) Gingivoplasty only
(B) Functional crown lengthening
(C) Incisional biopsy
(D) Immediate implant placement

163. A patient's radiograph reveals a large subgingival restoration margin 1 mm from the alveolar crest. On clinical exam, the gingiva around the tooth is chronically inflamed. Which diagnosis explains this scenario?
(A) Gingival fibromatosis
(B) Mucocele formation
(C) Biologic width impingement causing chronic inflammation
(D) Traumatic ulcer

164. A dentist plans a full-coverage crown on a tooth with subgingival caries. The alveolar crest is too close to the prospective margin. Which sequence ensures a healthy restorative outcome?
(A) Immediate final crown cementation without preliminary surgery
(B) Crown lengthening surgery, healing, then tooth preparation and crown placement
(C) Extraction and placement of a removable partial denture
(D) Endodontic treatment of all adjacent teeth

165. According to accepted periodontal practice, how long should one generally wait after crown lengthening before finalizing the restoration?
(A) One to two days
(B) Two to four weeks
(C) Six to eight weeks or longer, allowing stable gingival healing
(D) No waiting—immediate restoration

166. A patient with a "gummy smile" is recommended for esthetic crown lengthening. However, clinical observation reveals a short upper lip and normal gingival width. What alternative cause must be considered?
(A) Intrinsic tooth discoloration
(B) Overactive or hypermobile upper lip
(C) Fibrous epulis
(D) Exostosis on the palatal aspect

167. What key feature might indicate that inadequate bone recontouring was performed during crown lengthening?
(A) Rapid recurrence of deep periodontal pockets with stable restoration margins
(B) Continuation of inflamed gingiva around the restoration margin
(C) Total resolution of gingival inflammation within one week
(D) Complete tooth mobility elimination

168. Assertion (A): In esthetic crown lengthening, alveolar bone recontouring may be minimal or unnecessary if primarily removing excessive gingival tissue.
Reason (R): Excessive gingival display sometimes arises from altered passive eruption where bone-to-cementoenamel junction distance is normal.
(A) Both A and R are true, and R explains A
(B) Both A and R are true, but R does not explain A
(C) A is true, R is false
(D) A is false, R is true

169. A patient complains of severe sensitivity after crown lengthening around lower premolars. Which immediate management step is most appropriate?
(A) Apply desensitizing agents or fluoride varnish to exposed root surfaces
(B) Schedule immediate recontouring surgery to remove more bone
(C) Perform root canal therapy on all premolars
(D) Extract the sensitive teeth

170. Which radiographic feature helps confirm sufficient bone recontouring after crown lengthening?
(A) A 1–2 mm distance from alveolar crest to restoration margin
(B) Large periapical radiolucency
(C) Radiopaque lines extending from the crown margin to the pulp chamber
(D) Excessively thick alveolar crest

171. A 36-year-old has a fractured lower molar with only 2 mm of coronal tooth above the gingiva. The dentist recommends crown lengthening. Which key factor ensures a stable final restoration?
(A) Leaving margins 0.5 mm below the gingiva
(B) Preserving 2–3 mm of biologic width
(C) Using a glass ionomer core without removing bone
(D) Cementing a restoration immediately after bone recontour

172. A 29-year-old patient complains of an unaesthetic smile revealing excess gum tissue around anterior teeth. Examination confirms normal bone height but prolonged gingiva covering part of the clinical crown. Radiographs show no infrabony pockets. Which corrective measure is most suitable to reduce gingival display?
(A) Simple gingivectomy/esthetic crown lengthening
(B) Osseous resective surgery
(C) Frenectomy
(D) Free gingival graft

173. A 42-year-old has multiple restorations nearing the gingival margin on premolars with recurrent decay. Radiographic analysis confirms alveolar crest proximity. The dentist seeks stable restorative margins. What combined surgical approach is ideal?
(A) Apically positioned flap with osseous recontour for functional crown lengthening
(B) Palatal rolling technique
(C) Connective tissue graft for coverage
(D) Vertical root resection

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174. A 57-year-old patient with moderate periodontitis presents with two nonadjacent molars requiring functional crown lengthening due to deep subgingival caries. Clinical measurements confirm minimal keratinized tissue. The dentist decides on an apically positioned flap. However, the risk of exposing alveolar mucosa is high. Outline the recommended approach to maintain stable gingival coverage.
(A) Perform a standard gingivectomy
(B) Combine apically positioned flap with partial-thickness design and possible mucogingival augmentation
(C) Extract the molars
(D) Delay all intervention for six months

175. Why might a dentist prefer orthodontic extrusion over surgical crown lengthening for certain teeth requiring more coronal structure?
(A) Orthodontic extrusion causes no changes to alveolar bone height
(B) Surgical procedures are guaranteed to cause pulp necrosis
(C) Orthodontic extrusion can preserve gingival architecture without extensive bone removal
(D) Surgical crown lengthening never achieves biologic width

176. Which of the following best defines a free gingival graft?
(A) Transferring a segment of gingiva from the palate or other donor site to increase keratinized tissue
(B) Surgically removing alveolar bone to reduce pockets
(C) Applying a resin splint to stabilize mobile teeth
(D) Using a bone graft to regenerate intrabony defects

177. Which clinical scenario frequently indicates the need for a free gingival graft?
(A) Excess attached gingiva already present
(B) Mucogingival junction near the tooth margin with persistent recession
(C) Deep intrabony defects with vertical bone loss
(D) Fully edentulous ridges with no implants planned

178. Why is an adequate zone of keratinized gingiva important around teeth or implants?
(A) Prevents all forms of caries
(B) Enhances esthetics only, with no impact on health
(C) Facilitates plaque control, reduces inflammation, and provides stable soft tissue margins
(D) Eliminates the need for daily brushing

179. All of the following are steps in a free gingival graft procedure except:
(A) Harvesting a graft from the palatal donor site
(B) Meticulous adaptation of graft to the recipient bed
(C) Suturing to stabilize the graft
(D) Leaving the graft unattached for secondary intention healing

180. How does a free gingival graft differ from a subepithelial connective tissue graft?
(A) A free gingival graft transplants connective tissue alone, while a subepithelial graft uses full-thickness gingiva
(B) A subepithelial graft aims to increase keratinized tissue only, whereas a free graft corrects root coverage
(C) A free gingival graft includes epithelium and connective tissue, while a subepithelial graft primarily transfers connective tissue beneath a partial flap
(D) Subepithelial grafts must always be harvested from alveolar mucosa

181. A tooth with advanced recession and minimal attached gingiva requires coverage. Which grafting technique is often considered the gold standard for predictable root coverage?
(A) Subepithelial connective tissue graft
(B) Gingivectomy around the recession defect
(C) Frenectomy in the area
(D) Free rotated palatal flap

182. A 43-year-old patient complains of cervical abrasion lesions with 4 mm of recession on facial surfaces. There is adequate papilla height. Which surgical approach optimally covers these exposed roots and improves tissue thickness?
(A) Distal wedge procedure
(B) Coronally advanced flap with subepithelial connective tissue graft
(C) Gingivoplasty alone
(D) Lateral sliding flap from an edentulous ridge

183. Which clinical feature most strongly indicates success in a subepithelial connective tissue graft procedure for root coverage?
(A) Persistent root sensitivity
(B) Postoperative alveolar bone loss around the donor site
(C) Pink, firm gingiva bridging the previous recession site with minimal inflammation
(D) Graft necrosis or sloughing after one week

184. In subepithelial connective tissue grafting for root coverage, which step is incorrect?
(A) Harvesting connective tissue from the palate
(B) Leaving the graft unsupported, allowing it to move with the patient's tongue
(C) Placing the graft beneath a carefully prepared partial-thickness flap
(D) Achieving passive coronal flap advancement over the graft

185. Given meticulous technique and good patient compliance, what is the likelihood of significant root coverage with subepithelial connective tissue grafting in moderate recession defects?
(A) Low unless multiple surgeries are repeated
(B) Quite high, often achieving 80-100% coverage
(C) Impossible to predict
(D) Only 10-20% coverage

186. Why does excessive flap tension or poor suturing typically result in graft failure in soft tissue augmentation procedures?
(A) Tension stimulates osteogenesis
(B) The graft revascularizes more quickly under tension
(C) Disruption of the blood supply and micro-movement inhibit successful graft healing
(D) Tension encourages immediate keratinization

187. A 50-year-old with recession on the canine complains of sensitivity. Examination reveals a thin phenotype. Which grafting choice best thickens the tissue and covers exposed roots?
(A) Allograft granules
(B) Free gingival graft
(C) Subepithelial connective tissue graft
(D) Sutureless flap

188. A patient with multiple areas of mild recession and an overall lack of keratinized tissue requests treatment. Which diagnosis leads the clinician to recommend a free gingival graft to widen attached gingiva before addressing recession?
(A) Adequate band of keratinized gingiva
(B) Minimal attached gingiva with a high mucogingival junction near the recession
(C) Normal alveolar bone levels and 3 mm of keratinized tissue
(D) Excessive gingival display with thick phenotype

189. A dentist considers either a free gingival graft or subepithelial connective tissue graft to manage recession. The patient prioritizes aesthetics. Which graft is generally preferred?
(A) Free gingival graft, due to color matching
(B) Subepithelial connective tissue graft, as it often blends more seamlessly with adjacent tissue
(C) Only an alloplastic membrane
(D) Horizontal bone augmentation

190. Per accepted protocols, how long should a patient typically avoid brushing the graft site after a free gingival or connective tissue graft?
(A) 1 day
(B) At least 1–2 weeks, supplemented with a gentle rinse
(C) No restriction—vigorous brushing on day 1
(D) 3 months without hygiene

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191. At a one-week post-op check, a connective tissue graft site appears whitish and sloughing. Which complication must be ruled out?
(A) Normal healing of the epithelium
(B) Early graft necrosis
(C) Orthodontic relapse
(D) Tooth ankylosis

192. Which sign suggests successful healing of a free gingival graft at two weeks?
(A) Persistent heavy bleeding under the graft
(B) Firm, pink adaptation of the graft without mobility
(C) Foul odor and sloughing at the margins
(D) Pus discharge around suture lines

193. Assertion (A): A free gingival graft can increase keratinized tissue but may not achieve significant root coverage.
Reason (R): The graft is typically placed apical to the recession area, focusing on augmenting attached gingiva rather than coronally covering the defect.
(A) Both A and R are true, and R explains A
(B) Both A and R are true, but R does not explain A
(C) A is true, R is false
(D) A is false, R is true

194. A clinician notes partial dehiscence of a gingival graft one week post-surgery. Which management strategy is appropriate?
(A) Immediate graft removal
(B) Suture stabilization if possible and careful monitoring for reattachment
(C) Frequent brushing of the graft
(D) Full-mouth antibiotic therapy for six months

195. If graft necrosis is suspected, which diagnostic step can confirm viability or nonviability?
(A) Histopathological examination of the healing epithelium
(B) Thermal pulp testing on adjacent teeth
(C) Light digital pressure to evaluate color change and capillary refill in the graft
(D) Bitewing radiograph

196. A patient with minimal attached gingiva at the mandibular premolar exhibits repeated tissue breakdown. The dentist suggests a free gingival graft. What immediate preoperative factor is crucial for success?
(A) Heavy smoking habit
(B) Donor site condition and thickness on the palate
(C) Incomplete caries removal on adjacent teeth
(D) Absence of any alveolar bone on the recipient site

197. A 38-year-old complains of narrow bands of keratinized tissue causing discomfort during brushing around mandibular canines. Multiple attempts at improving brushing technique failed. The periodontist plans a free gingival graft from the palate. What is the key rationale for this graft?
(A) Restoring alveolar bone height
(B) Eliminating all pockets
(C) Increasing attached gingiva to enhance plaque control
(D) Immediately covering carious lesions

198. A 60-year-old with recession on multiple anterior teeth seeks aesthetic improvement. Previous attempts with free gingival grafts created color mismatches. The periodontist recommends subepithelial connective tissue grafts. What advantage does this approach offer?
(A) Faster healing with minimal anesthesia
(B) Better color blend and contour in visible areas
(C) Requires no donor site
(D) Mandatory broad alveolar bone recontouring

199. A patient with generalized recession and thin gingival phenotype has partial coverage using subepithelial connective tissue grafts on the maxillary canines. At the two-week follow-up, the periodontist sees mild edema and stable suture lines. The patient mentions occasional bleeding upon gentle brushing. Radiographs show no bony defects. Outline the most appropriate next step in managing this case.
(A) Immediate second surgery to add more grafts
(B) Advise thorough but gentle oral hygiene, continue to monitor healing

(C) Remove the graft to eliminate potential necrosis
(D) Place partial dentures to protect the grafted sites

200. Assertion (A): Free gingival grafting is primarily indicated to widen keratinized gingiva, while subepithelial connective tissue grafting is often chosen for root coverage.
Reason (R): Epithelium in a free graft can appear color-mismatched, whereas connective tissue grafts remain hidden beneath a flap, providing superior aesthetics.
(A) Both A and R are true, and R explains A
(B) Both A and R are true, but R does not explain A
(C) A is true, R is false
(D) A is false, R is true

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CHAPTER 06

PUBLIC HEALTH DENTISTRY

1. Which of the following statements best defines Public Health?
   (A) The study of individual biology without considering social influences
   (B) Organized community efforts focused on preventing disease and promoting health
   (C) Curative medical services provided by private practitioners
   (D) Research on inherited disorders within a small family unit

2. Which core public health function primarily involves collecting data to monitor and understand health issues within a population?
   (A) Policy Development
   (B) Assurance
   (C) Assessment
   (D) Implementation

3. Which of the following best characterizes Dental Public Health?
   (A) Restricting dental services to children under five years
   (B) Focusing on individual clinical treatments for oral diseases
   (C) Combining community-based strategies to prevent and control oral diseases on a broader scale
   (D) Prioritizing only specialized hospital-based oral care

4. All of the following are recognized achievements of Public Health except:
   (A) Vaccination programs
   (B) Control of infectious diseases
   (C) Automated robotic surgeries
   (D) Recognition of tobacco as a health hazard

5. When comparing Public Health to Clinical Medicine, which statement best captures the difference in focus?
   (A) Public Health aims to treat one patient at a time, while Clinical Medicine targets entire communities
   (B) Clinical Medicine involves social and economic reforms for disease prevention, whereas Public Health focuses on specialized treatments
   (C) Clinical Medicine addresses the health of individuals, whereas Public Health deals with health at the population or community level
   (D) Both primarily concentrate on laboratory experiments to discover new treatments

6. Which agency is typically responsible for coordinating large-scale public health initiatives in India?
   (A) Indian Medical Association (IMA)
   (B) Central Bureau of Investigation (CBI)
   (C) Directorate General of Health Services (DGHS)
   (D) National Medical Commission (NMC)

7. "Social Determinants of Health" refer to:
   (A) Genetic predispositions that affect individual health
   (B) Economic, environmental, and social factors influencing population well-being
   (C) Infectious pathogens causing communicable diseases
   (D) Government guidelines for medical licensing

8. Which factor is considered a key component in designing a successful Public Health campaign to reduce oral diseases at the population level?
   (A) Exclusive reliance on advanced operative dentistry

(B) Engaging community stakeholders and oral health professionals
(C) Random application of fluorides without guidelines
(D) Avoidance of mass media educational strategies

9. A community experiences high rates of dental caries among schoolchildren. Which public health measure would be most effective initially for broad preventive impact?
(A) Individual restorations for each child
(B) Community water fluoridation program
(C) Exclusive distribution of mouthwashes to a few families
(D) Hiring more dental specialists for complex treatments

10. In Dental Public Health, which of the following best explains why prevention is prioritized over solely curative approaches?
(A) Because it completely removes the need for any clinical dentistry
(B) It tends to be less cost-effective than individual treatment
(C) Preventive measures can reduce disease incidence and healthcare costs on a larger scale
(D) It only helps a small group at higher risk

11. Assertion (A): Dental Public Health practitioners emphasize community-level interventions.
Reason (R): Oral diseases have widespread risk factors that can be mitigated only through individual restorative procedures.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

12. Which level of prevention is exemplified by a community's mass application of pit-and-fissure sealants in children's molars?
(A) Primary Prevention
(B) Secondary Prevention
(C) Tertiary Prevention
(D) Quaternary Prevention

13. High sugar consumption leads to increased dental caries in a population. Which preventive strategy directly targets this cause-effect relationship at the community level?
(A) Implementing daily fluoride mouth-rinse programs
(B) Public education campaigns on limiting sugary snacks
(C) Offering free dental restorations for carious teeth
(D) Providing partial dentures for edentulous patients

14. A rural community lacks dental infrastructure. Which initial preventive measure is most appropriate to reduce oral diseases systematically?
(A) Compulsory weekend visits by private practitioners
(B) Educating local healthcare workers to deliver basic oral health instruction and fluoride toothpaste
(C) Building a new specialized dental hospital immediately
(D) Individual root canal therapies for each household

15. What is the best definition of "Secondary Prevention" in the context of Dental Public Health?
(A) Rehabilitating individuals after irreversible organ damage
(B) Detecting disease in its early stages and intervening to halt progression
(C) Preventing the initial occurrence of disease
(D) Eliminating the entire pathogen from the community

16. Which statement highlights the main contrast between Primary and Tertiary Prevention in dental contexts?
(A) Primary prevention focuses on screening for disease, while tertiary prevention prevents disease onset

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(B) Primary prevention stops disease before it starts; tertiary prevention reduces complications of advanced disease
(C) Both concentrate on late-stage treatments for individuals with chronic oral conditions
(D) Both are solely concerned with providing dentures to edentulous patients

17. Which of the following exemplifies Tertiary Prevention in dentistry?
(A) Application of fluoride varnish in schools
(B) Comprehensive rehabilitation with dentures or implants
(C) Screening for early enamel lesions
(D) Educating parents about dietary practices

18. The key action of dental sealants in preventing caries is:
(A) Remineralizing enamel once it is fully demineralized
(B) Sealing and protecting pits and fissures from bacterial colonization
(C) Removing carious dentin to halt disease progression
(D) Replacing missing teeth in advanced stages of decay

19. When promoting community-level primary prevention of oral diseases, which of the following steps would be incorrect?
(A) Providing regular dental check-ups at schools
(B) Implementing safe water fluoridation
(C) Subsidizing candies to encourage daily sugar intake
(D) Conducting oral health awareness programs

20. A local health department plans to distribute free toothbrushes and fluoride toothpaste in areas with limited resources. This intervention is an example of:
(A) Primary Prevention
(B) Secondary Prevention
(C) Tertiary Prevention
(D) Diagnostic Screening

21. Which strategy is most effective in addressing high periodontal disease rates in a large population?
(A) Organizing free scaling camps for symptomatic individuals only
(B) Launching a community-wide oral hygiene education and plaque control campaign
(C) Providing individual gum surgeries for advanced cases
(D) Investing solely in specialized periodontists in urban hospitals

22. A 10-year-old child presents in a mobile dental van with mild gingivitis and early carious lesions. The parents request guidance on preventing further decay and gum inflammation.
(A) Refer to tertiary care center immediately
(B) Apply fluoride varnish and offer oral hygiene instruction
(C) Perform immediate root canal on all affected teeth
(D) Schedule orthodontic consultation

23. Which of the following principles underlies the community approach in Public Health Dentistry?
(A) Focus on individual high-cost treatments
(B) Delay interventions until disease is widespread
(C) Encourage passive reception of information from experts only
(D) Empower communities to participate in identifying and solving oral health problems

24. What does “Health Promotion” in Public Health Dentistry primarily entail?
(A) Merely offering emergency dental services
(B) Educating and enabling individuals and communities to improve their oral health
(C) Providing high-end cosmetic dental procedures at reduced cost
(D) Restricting public involvement in oral health policy decisions

25. Which organization famously defines Health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity"?
(A) World Health Organization (WHO)
(B) Centers for Disease Control and Prevention (CDC)
(C) United Nations Educational, Scientific and Cultural Organization (UNESCO)
(D) National Institutes of Health (NIH)

26. Which statement accurately encapsulates the goal of Preventive Dentistry?
(A) Focus solely on complex oral surgeries
(B) Prevent, arrest, and control oral diseases at both individual and community levels
(C) Offer treatment only when severe dental pathology is evident
(D) Emphasize cosmetic improvements over functional health

27. Which of the following is an example of a public health measure at the primary prevention level for oral health?
(A) Annual screening for early enamel lesions
(B) Providing dentures to edentulous older adults
(C) Mass education on oral hygiene practices
(D) Immediate restorative procedures for detected cavities

28. All of the following are standard public health measures to reduce caries except:
(A) Water fluoridation
(B) Oral health education
(C) Promotion of excessive sugary snacks
(D) Regular brushing campaigns in schools

29. How does primary prevention differ from secondary prevention in the context of fluoride application?
(A) Primary prevention involves using fluoride to strengthen sound teeth, while secondary prevention targets early incipient lesions
(B) Both are identical since fluoride serves the same purpose
(C) Only secondary prevention uses fluorides in any context
(D) Primary prevention is about filling cavities with fluoride-based restorations

30. A local government wants to decrease dental caries rates among children. Which primary preventive approach would be most cost-effective for the entire region?
(A) Installing a mobile dental clinic offering fillings
(B) Community water fluoridation
(C) Providing free crowns and bridges
(D) Conducting monthly tooth extractions in schools

31. Assertion (A): Fluoridation is recommended as a public health measure.
Reason (R): Excessive fluoride exposure can lead to dental fluorosis, so fluoridation is never advised at community level.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

32. Which public health policy measure best addresses the issue of early childhood caries in a low-resource setting?
(A) Requiring weekly professional cleanings for every child
(B) Mandating high taxes on fluoride toothpaste
(C) Integrating oral health education into school curricula
(D) Restricting the distribution of basic toothbrushes to private clinics only

33. Increased availability of low-cost sugary beverages in a community correlates with higher caries incidence. Which primary preventive action tackles this cause-and-effect directly?
(A) Organizing free tooth extraction camps
(B) Imposing taxes or restrictions on sugary drinks while promoting healthier alternatives

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(C) Performing scalings and root planings for older adults
(D) Providing referral services for advanced restorative care

34. According to WHO guidelines, an important strategy in preventing oral diseases includes:
(A) Disallowing any sugar in the diet
(B) Universal basic coverage of affordable fluoride toothpaste
(C) Prioritizing invasive cosmetic procedures as a public service
(D) Limiting education on brushing techniques due to cost constraints

35. A non-governmental organization (NGO) wants to implement a preventive dentistry program in a remote village. Which measure best ensures sustainability?
(A) One-time distribution of high-tech electric toothbrushes
(B) Ongoing training of village health workers on oral hygiene and fluoride use
(C) Sending volunteer dentists every five years for check-ups
(D) Building a large dental hospital with only specialized equipment

36. If a child's incipient pit-and-fissure lesion is detected on a first permanent molar, what is the best preventive management step?
(A) Extract the tooth immediately to avoid complications
(B) Monitor without any intervention for multiple years
(C) Apply sealant or fluoride to arrest lesion progression
(D) Proceed with full-coverage crown placement

37. All of the following align with the concept of minimal intervention dentistry in preventive care, except:
(A) Early detection of lesions
(B) Sealing non-cavitated fissures
(C) Providing extensive full-mouth reconstructions at early stages
(D) Using fluoride to remineralize incipient lesions

38. A school dental screening program finds that 60% of children have early gingivitis. What is the best next step in managing this finding at the community level?
(A) Refer only the worst cases for periodontal surgery
(B) Launch a comprehensive school-based brushing and oral hygiene education program
(C) Immediately arrange for prosthetic treatment for all children
(D) Eliminate routine follow-up in the program

39. The key feature of primary prevention in the context of periodontal diseases is:
(A) Identifying subgingival calculus and scheduling deep cleaning
(B) Teaching effective brushing and flossing to prevent plaque accumulation
(C) Performing gingivoplasty in aesthetic zones
(D) Using advanced bone grafts for periodontally compromised teeth

40. A 12-year-old living in a non-fluoridated area reports for a routine check. The dentist notices incipient caries. Parents ask for advice on strengthening the child's teeth.
(A) Prescribe dietary sugar to increase saliva flow
(B) Advise daily high-fluoride toothpaste and routine brushing
(C) Suggest no intervention until cavities form
(D) Start prosthodontic work immediately

41. How does community fluoridation contribute to health equity in Preventive Dentistry?
(A) It benefits only the wealthy who can afford private clinics
(B) It targets people who have already lost most of their teeth
(C) It offers uniform caries prevention benefits across socioeconomic statuses
(D) It replaces the need for brushing and flossing altogether

42. Which term describes the process of providing dental education, hands-on care, and follow-up services to a population to prevent oral diseases before they occur?
(A) Curative approach
(B) Palliative care
(C) Prophylaxis
(D) Tertiary rehabilitation

43. Which government-led measure directly serves as a primary preventive strategy for dental caries in many countries?
(A) Public dental insurance covering all implant costs
(B) Free orthodontic treatment for malocclusions
(C) Fortification of public water supplies with fluoride
(D) Annual mass extraction drives

44. In a community where dental check-ups are rare, a health official wants to address early oral lesions without sophisticated equipment. The best next step is:
(A) Implementing a basic screening and referral system using trained health workers
(B) Building a high-end dental hospital with specialized lasers
(C) Postponing all oral checks until advanced technology is accessible
(D) Offering only prosthetic replacements for missing teeth

45. Assertion (A): Improving oral hygiene habits in a population significantly reduces the burden of dental caries and gingivitis.
Reason (R): Dental caries and gingivitis are largely related to plaque accumulation and cariogenic diets.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

46. For a community-based plaque control program, which proposed step would be incorrect?
(A) Encouraging daily brushing with fluoride toothpaste
(B) Conducting demonstrations on proper flossing technique
(C) Providing sugary snacks at the brushing demonstration to test new skills
(D) Encouraging parents' involvement in supervising children's oral care

47. According to standard preventive protocols, at what stage should a child receive fluoride varnish applications?
(A) Only after multiple permanent teeth are lost
(B) Periodically once permanent teeth start to erupt
(C) Only in adulthood when caries is advanced
(D) Exclusively if the child consumes no sugar

48. A 14-year-old student, in a region without water fluoridation, exhibits frequent snacking habits and minimal brushing routine. On dental exam, early white spot lesions are seen on incisors and molars. The public health team wants a broad intervention approach to reduce future caries rates for all students.
(A) Provide immediate crowns
(B) Water fluoridation, nutritional counseling, and fluoride toothpaste distribution
(C) Solely treat advanced carious teeth
(D) Conduct sporadic, unplanned dental camps

49. A 30-year-old working mother reports to a community clinic with mild sensitivity and occasional bleeding gums. She has limited time for dental visits, relies heavily on processed snacks, and brushes once a day. Examination reveals mild plaque accumulation, early enamel lesions, and moderate gingivitis.
(A) Advise immediate extractions
(B) Initiate a structured dietary modification and oral hygiene reinforcement plan
(C) Perform multiple root canals on all sensitive teeth
(D) Provide only painkillers and no further follow-up

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50. A 35-year-old teacher presents with multiple cervical abrasions, mild gingival recession, and moderate plaque buildup. Her lifestyle includes frequent tea breaks with sweet biscuits. She desires to prevent further damage and maintain oral health effectively. What is the optimal preventive plan?
(A) Prescribe full dentures
(B) Recommend immediate prosthodontic consultation
(C) Introduce gentle brushing technique, reduce sugary snacks, and use fluoride mouthwash
(D) Schedule quarterly tooth extractions

51. "DMFT" stands for which components in an epidemiologic measure for dental caries?
(A) Decayed, Missing, and Filled Teeth
(B) Distal, Mesial, and Facial Tuberosities
(C) Dentine, Molar, and Fluoride Treatments
(D) Dental Metallic Fillings and Tartar

52. Which age group is typically used for the standardized application of the DMFT index in most adult populations?
(A) 0–2 years
(B) 6–7 years
(C) 35–44 years
(D) 65–74 years

53. How does the def index differ from the DMFT index in pediatric dental epidemiology?
(A) The def index measures calculus only, whereas DMFT measures caries
(B) The def index evaluates deciduous teeth, while DMFT focuses on permanent teeth
(C) The def index is used only for research in geriatric populations
(D) There is no essential difference; they are interchangeable

54. All of the following are components measured by the Community Periodontal Index (CPI) except:
(A) Bleeding on probing
(B) Calculus presence
(C) Pocket depth
(D) Coronal caries lesions

55. Which statement describes the main purpose of the OHI-S (Simplified Oral Hygiene Index)?
(A) It evaluates only the presence of malocclusion
(B) It measures plaque and calculus on selected tooth surfaces to determine oral hygiene status
(C) It calculates the severity of gingival recession
(D) It tracks fluoride uptake in the enamel

56. Which index is commonly used for measuring plaque specifically, separate from calculus, in epidemiological studies?
(A) Greene and Vermillion Index
(B) Gingival Index (GI)
(C) Plaque Index (Silness and Löe)
(D) Periodontal Screening and Recording (PSR)

57. Assertion (A): The DMFT index can indicate both treated and untreated caries in a population.
Reason (R): DMFT includes only decayed and missing teeth, excluding restorations.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

58. Which dental index best serves the purpose of monitoring fluorosis levels in a community?
(A) Dean's Fluorosis Index
(B) Gingival Bleeding Index
(C) CPI (Community Periodontal Index)
(D) OHI-S

59. Which step would be incorrect when applying the Community Periodontal Index (CPI) in a field survey?
(A) Using a WHO periodontal probe
(B) Recording the highest score for each sextant
(C) Checking for calculus, bleeding, and pocket depth
(D) Measuring the DMF status during the same probing

60. A researcher wants to gauge both caries experience and periodontal health in a large population. Which combination of indices is most appropriate?
(A) DMFT and CPI
(B) Plaque Index and Dean's Index
(C) Gingival Index and def index
(D) OHI-S and Gingival Bleeding Index

61. Which index specifically grades calculus independently from plaque?
(A) Turesky-Gilmore-Glickman Modification of the Quigley-Hein Plaque Index
(B) Simplified Oral Hygiene Index- Calculus Component (OHI-S - Calculus)
(C) Bleeding on Probing Index
(D) Papillary-Marginal-Attachment (PMA) Index

62. A high CPI score in a population typically indicates:
(A) A decrease in the prevalence of calculus
(B) Minimal to no periodontal pockets
(C) An increased need for periodontal treatment
(D) Improvement in overall oral hygiene

63. What is the primary role of a dental index in epidemiological research?
(A) Generating random numbers for statistical analysis
(B) Providing a systematic way to assess and quantify oral health conditions
(C) Replacing clinical examinations with subjective feedback
(D) Limiting data collection to purely aesthetic considerations

64. Assertion (A): The def index is an essential tool in pediatric dental surveys.
Reason (R): It evaluates filled and extracted permanent teeth in children only.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

65. Which approach maximizes accuracy when using multiple dental indices in a large epidemiological survey?
(A) Training examiners with a standardized protocol and calibrating them
(B) Allowing each examiner to use personal judgment for scoring
(C) Keeping all scoring guidelines flexible and open to interpretation
(D) Relying solely on self-reported oral health status

66. In epidemiological terms, what is a "cross-sectional" oral health survey?
(A) An investigation observing a single population at one point in time
(B) A method that follows participants over multiple decades
(C) A clinical trial testing a new restorative material
(D) A randomized controlled study involving multiple treatment groups

67. Which sampling method is most likely to yield a representative subset of a population for an oral health survey?
(A) Convenience sampling
(B) Random sampling
(C) Judgmental sampling
(D) Snowball sampling

68. How does a prospective cohort study in dental research differ from a cross-sectional design?
(A) It measures outcomes and exposures simultaneously at one point
(B) It enrolls participants at baseline and follows them over time to observe outcomes
(C) It lacks any follow-up period
(D) It randomly assigns participants to different interventions

69. All of the following are key stages in designing an oral health survey except:
(A) Defining objectives and research questions
(B) Selecting an appropriate sample

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(C) Implementing a purely subjective scoring method with no calibration
(D) Choosing valid and reliable data collection instruments

70. What is the primary purpose of pilot testing a dental survey questionnaire?
(A) To immediately publish findings without data verification
(B) To identify any ambiguity or errors in the questionnaire before the main study
(C) To recruit a larger sample for the final survey
(D) To forego ethical clearance

71. A researcher aims to evaluate the effectiveness of a new mouthrinse in reducing plaque over six months. Which study design is most appropriate?
(A) Cross-sectional survey
(B) Longitudinal randomized controlled trial
(C) Case-control study
(D) Ecological study

72. How does a case-control study in dentistry differ from a cohort study when investigating risk factors for oral cancer?
(A) Case-control studies begin with healthy subjects, while cohort studies start with diseased subjects
(B) Case-control studies identify subjects based on outcome status and look back at exposures, while cohort studies track exposures first and look forward to outcomes
(C) They are identical in design and yield the same evidence level
(D) Both strictly use randomization for subject allocation

73. In research methodology, what is "bias"?
(A) A statistical test used to measure correlation
(B) A systematic error that skews study results away from truth
(C) A random variation in the data that is uncontrollable
(D) A gold standard measure for diagnosing diseases

74. A small community clinic notices an increase in early childhood caries. They plan to conduct a survey to explore dietary habits and fluoride exposure. What is the first research step?
(A) Analyze existing data sets
(B) Define a clear research question
(C) Immediately distribute fluoride tablets to every child
(D) Start statistical analysis without collecting new data

75. Assertion (A): Using standardized dental indices is optional in large-scale oral health surveys.
Reason (R): Standardization ensures data comparability and reliability across different examiners and populations.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

76. A principal investigator wants to ensure minimal inter-examiner variability in an oral health survey across multiple clinics. The best measure is to:
(A) Let each examiner create their own scoring system
(B) Provide only written instructions without practice sessions
(C) Conduct examiner calibration sessions with standardized guidelines and trial examinations
(D) Ignore variability as it averages out

77. According to WHO guidelines, what is a critical component when conducting national-level oral health surveys?
(A) Exclusively enrolling urban populations
(B) Deploying globally accepted standardized indices for data collection
(C) Relying solely on self-reports without clinical examinations
(D) Disregarding training and calibration of examiners

78. If an oral health survey uses inconsistent examination criteria, the likely effect is:
(A) Enhanced accuracy of findings
(B) Improved comparability across different study sites
(C) Increased risk of measurement bias
(D) Higher reliability in diagnosing caries

79. In oral health research, what distinguishes qualitative methods from quantitative methods?
(A) Qualitative methods focus on numerical data, while quantitative methods explore opinions and experiences
(B) Quantitative methods do not require structured questionnaires, whereas qualitative methods do
(C) Qualitative methods explore perceptions and contexts, while quantitative methods measure numerical outcomes
(D) Both methods are purely observational, with no structured data collection

80. A rural health center observes increased oral lesions among tobacco-chewing farmers. Over six months, data are gathered on each farmer's usage patterns and development of new lesions. Investigators compare these findings with non-tobacco users. Which study design does this scenario describe?
(A) Cross-sectional
(B) Case-control
(C) Cohort
(D) Ecological

81. What is a School Oral Health Program?
(A) A single day dental camp with no follow-up
(B) A structured initiative involving preventive, educational, and sometimes curative dental services within the school environment
(C) A mandatory curriculum for advanced prosthetics
(D) Exclusively a donation drive for dental tools

82. Which of the following is typically a core component in a well-designed school oral health program?
(A) Only advanced orthodontic corrections
(B) Twice-yearly screenings and referrals for necessary treatment
(C) Restricting oral health education to teachers alone
(D) Offering dentures for all students

83. All of the following strategies can enhance children's oral health in schools except:
(A) Supervised toothbrushing drills
(B) Providing nutritious, low-sugar snacks in canteens
(C) Ignoring minor carious lesions until they become painful
(D) Engaging parents in oral health awareness sessions

84. Why are school-based oral health programs considered vital in public health?
(A) Children typically have minimal exposure to community interactions
(B) Schools provide a captive audience to instill lifelong healthy habits early
(C) They focus solely on administering antibiotics for oral infections
(D) They cater only to high-income private schools

85. How does a comprehensive school oral health program differ from sporadic dental camps in terms of impact?
(A) Both have identical reach and sustainability
(B) A comprehensive program provides ongoing services and education, while a one-time camp offers temporary interventions
(C) Sporadic camps integrate the curriculum fully
(D) Both limit parental involvement

86. Which of the following is typically a key objective in planning a school oral health program?
(A) Providing post-graduate dental education
(B) Encouraging indefinite antibiotic use
(C) Promoting essential oral hygiene practices and conducting preventive measures
(D) Focusing solely on sports activities

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87. Assertion (A): Involving parents is crucial in school oral health programs.
Reason (R): Children's oral hygiene routines are often reinforced at home, making parental support essential.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

88. In planning a School Oral Health Program, which strategy best ensures coverage for disadvantaged students?
(A) Conducting the program exclusively in private schools
(B) Partnering with governmental or NGO resources to include public schools
(C) Limiting check-ups to families who can afford private insurance
(D) Charging high fees for each screening

89. A local dentist notices several cavities in first-graders during a school screening. She recommends pit-and-fissure sealants and fluoride varnish for prevention. Which step should the school take next?
(A) Ignore the dentist's suggestions
(B) Obtain parental consent and schedule preventive treatments
(C) Refer all students to an advanced oral surgeon
(D) Request immediate extractions

90. A rural school with 500 students experiences high rates of dental caries and low oral hygiene awareness. A visiting dental team aims to develop a sustainable program, including teacher training, regular screenings, and dietary interventions. What is the essential first action?
(A) Provide dentures for older students
(B) Conduct a baseline assessment of existing oral health status
(C) Immediately perform root canal treatments on all decayed teeth
(D) Eliminate recess to reduce snack intake

91. Which statement best defines an "oral health policy" at the national or international level?
(A) A guideline exclusively for private dental clinics
(B) A set of coordinated strategies and regulations designed to improve population-level oral health
(C) A directive that all citizens must undergo monthly dental procedures
(D) A mandatory licensing exam for dentists

92. Which global organization offers guidance on oral health policies and standards?
(A) World Trade Organization (WTO)
(B) World Health Organization (WHO)
(C) International Monetary Fund (IMF)
(D) United Nations High Commissioner for Refugees (UNHCR)

93. All of the following initiatives might be found in a national oral health policy except:
(A) Training more dental auxiliaries to serve rural areas
(B) Allocating funds for water fluoridation in high-risk zones
(C) Launching public awareness campaigns on oral hygiene
(D) Outlawing all forms of preventive dentistry to boost private business

94. Why do international bodies emphasize integrated oral health policies rather than isolated dental initiatives?
(A) Oral health is unrelated to general health
(B) Integrated policies ensure collaboration across sectors like nutrition, education, and healthcare for broader impact
(C) Isolated dental care has proven superior outcomes
(D) International bodies do not focus on oral health at all

95. Which of the following is a key goal of India's National Oral Health Policy?
(A) Restricting oral healthcare to metropolitan areas

(B) Emphasizing curative treatments over prevention
(C) Strengthening community-based preventive strategies and providing equitable access
(D) Shutting down dental colleges

96. Introducing a subsidized dental insurance policy nationwide likely leads to:
(A) A decline in the demand for oral healthcare
(B) Reduced focus on early intervention
(C) Increased access to routine dental care and preventive services
(D) Excessive out-of-pocket expenditures

97. Which principle underlies WHO's "Basic Package of Oral Care"?
(A) Ensuring only high-end cosmetic treatments
(B) Providing a minimal set of affordable preventive and primary oral health services
(C) Recommending advanced implants for every citizen
(D) Excluding any emphasis on community outreach

98. How do national oral health policies differ from local municipal initiatives?
(A) National policies often set broad frameworks and funding, while municipal initiatives adapt them to local needs
(B) Both are irrelevant to improving community oral health
(C) Local municipal initiatives override national laws
(D) There is no difference between the two

99. A developing country faces rising rates of untreated dental caries and minimal access to care in rural communities. Their new oral health policy should first focus on:
(A) Enacting mandatory private insurance for all citizens
(B) Building lavish specialized clinics in major cities
(C) Training and deploying mid-level dental providers for preventive and basic treatment services
(D) Subsidizing high-cost cosmetic procedures

100. A country's Ministry of Health reviews data showing that over 70% of rural adults lack basic dental care access. The national oral health policy proposes:
Which measures are most aligned with public health goals to reduce oral health disparities?
(A) 1, 2, and 3 only
(B) 1 and 4 only
(C) 2 and 4 only
(D) 1, 2, 3, and 4

101. Which of the following statements best defines a "social determinant of oral health"?
(A) A clinical procedure used to restore carious teeth
(B) Factors like income, education, and access to care that influence oral health outcomes
(C) A purely genetic predisposition to dental diseases
(D) Exclusive scientific research on enamel structure

102. Which era saw the formal emergence of Public Health as an organized discipline worldwide?
(A) Early medieval period
(B) Late 19th century
(C) Renaissance
(D) 21st century

103. Dental Public Health differs from clinical dentistry primarily by focusing on:
(A) Individual treatment outcomes in a private practice
(B) Advanced restorative procedures for single patients
(C) Health promotion and disease prevention on a community scale
(D) Cosmetic procedures funded privately

104. All of the following are core functions of Public Health except:
(A) Assessment
(B) Policy Development

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(C) Collaboration
(D) Assurance

105. Which of the following contrasts Public Health Dentistry with Community Dentistry?
(A) They are two names for the exact same discipline, differing only regionally
(B) Public Health Dentistry focuses on national guidelines, whereas Community Dentistry is strictly local
(C) Community Dentistry emphasizes direct outreach and local-level interventions, while Public Health Dentistry can influence larger-scale policy
(D) Community Dentistry excludes epidemiological principles, whereas Public Health Dentistry uses them extensively

106. "Primary Prevention" in Dentistry is aimed at:
(A) Early detection and prompt treatment of disease
(B) Rehabilitating patients with severe tooth loss
(C) Outlawing all sugar in the diet
(D) Preventing the disease from occurring in the first place

107. Which preventive measure specifically lowers mutans streptococci levels in the oral cavity?
(A) Pit-and-fissure sealants alone
(B) Application of xylitol-containing products
(C) Mandating high-sugar school lunches
(D) Smoking cessation clinics

108. Why are fissure sealants considered an effective form of primary prevention?
(A) They cure established decay
(B) They replace missing enamel through grafting
(C) They block bacterial colonization in vulnerable pits and fissures
(D) They serve only aesthetic purposes for discolored teeth

109. All of the following are considered secondary preventive measures in dentistry except:
(A) Regular screening for early enamel lesions
(B) Scaling and polishing to remove early calculus deposits
(C) Fluoride mouth rinses to arrest incipient caries
(D) Placement of immediate dentures after tooth extraction

110. How does tertiary prevention in dentistry differ from primary prevention?
(A) Tertiary prevention deals with preventing the initial occurrence of disease, while primary prevention restores lost function
(B) Primary prevention involves diagnosing diseases in their early stages, while tertiary prevention bans sugary diets
(C) Tertiary prevention aims to rehabilitate function after significant disease progression, while primary prevention prevents disease onset
(D) There is no difference, as both target the same stage of disease development

111. Which component is NOT recorded in the DMFT index?
(A) Decayed permanent teeth
(B) Missing permanent teeth due to caries
(C) Filled permanent teeth
(D) Stained permanent teeth with no caries

112. What does the "def" index measure in pediatric dentistry?
(A) Decayed, extracted (due to caries), and filled primary teeth
(B) Decided, eroded, and fully erupted permanent teeth
(C) Discolored, enamel-fractured, and fissured adult teeth
(D) Diastema, edentulism, and fluoride usage

113. Which rationale explains why indices like DMFT are vital in assessing community oral health?
(A) They precisely measure a single patient's satisfaction with treatment

(B) They allow for standardized comparisons of caries experience across different populations
(C) They only evaluate severe gum diseases
(D) They replace clinical examinations

114. All of the following are valid periodontal indices except:
(A) CPITN (Community Periodontal Index of Treatment Needs)
(B) CPI (Community Periodontal Index)
(C) Gingival Index (Löe and Silness)
(D) Dean's Fluorosis Index

115. What distinguishes the Plaque Index (Silness and Löe) from the OHI-S index?
(A) Plaque Index measures plaque thickness at the gingival margin, while OHI-S scores both plaque and calculus on selected tooth surfaces
(B) They both only measure calculus
(C) OHI-S focuses solely on extrinsic stains, while Plaque Index addresses decayed teeth
(D) They are identical measures with no practical distinction

116. A municipal health officer wants to track changes in caries prevalence annually among the same group of children. Which study design best fits this goal?
(A) Cross-sectional study
(B) Longitudinal study
(C) Ecological study
(D) Case-control study

117. What is the main feature of a "case-control study" in oral health research?
(A) Observing a healthy group forward in time to see who develops disease
(B) Randomly assigning participants to treatment or placebo
(C) Selecting subjects based on current disease status and comparing their past exposures
(D) Investigating entire populations without individual data

118. Assertion (A): A randomized controlled trial (RCT) is considered the gold standard for testing new dental interventions.
Reason (R): RCTs ensure participants randomly receive either the intervention or a control, reducing selection bias.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

119. All of the following steps are essential in an oral health survey protocol except:
(A) Choosing valid indices
(B) Training and calibrating examiners
(C) Selecting a random, representative sample
(D) Conducting only unstructured interviews without standardized measures

120. How does a cross-sectional oral health survey differ from a longitudinal one?
(A) Cross-sectional collects data at a single point, while longitudinal follows subjects over time
(B) They are identical in data collection and analysis
(C) Longitudinal surveys only use self-reported questionnaires, while cross-sectional requires clinical exams
(D) Cross-sectional surveys are never used in dental research

121. Which statement best defines a School Oral Health Program?
(A) A one-day event without educational follow-up
(B) A comprehensive plan integrating dental check-ups, preventive services, and oral health education within the school setting
(C) A marketing campaign for expensive dental clinics
(D) A mandatory root canal procedure for all students

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122. Which of the following is a common component of many successful school oral health programs worldwide?
(A) Fluoride varnish applications at scheduled intervals
(B) Mandatory extraction of erupting wisdom teeth
(C) Marketing sugary beverages during lunch
(D) Performing cosmetic bleaching on all students

123. Why is involving teachers crucial in a school-based dental program?
(A) Teachers can perform surgical procedures
(B) Teachers ensure the knowledge and practices taught reach children consistently in daily routines
(C) Teachers only supervise post-graduate dental theses
(D) Teachers replace the need for any dental professionals

124. All of the following support a sustainable School Oral Health Program except:
(A) Regular interactive sessions on oral hygiene for students
(B) Involving parents/guardians in awareness campaigns
(C) Only providing advanced prosthetic treatments to a few students
(D) Periodic evaluations to measure program impact

125. Which statement differentiates a comprehensive school-based oral health program from a short-term dental outreach camp?
(A) Both rely solely on mobile van visits
(B) A comprehensive program involves ongoing education, prevention, and follow-up care; outreach camps are typically brief, with limited follow-up
(C) Outreach camps guarantee daily supervision of brushing, whereas comprehensive programs do not
(D) Both exclude teacher involvement

126. Which global organization launched the concept of "Health for All by the Year 2000," influencing many oral health policies?
(A) UNESCO
(B) WHO
(C) FAO
(D) UNICEF

127. What is the core objective of national oral health policy?
(A) To privatize all dental services
(B) To mandate daily tooth extractions
(C) To improve population-level oral health through organized strategies, resources, and regulations
(D) To restrict dental care to metropolitan cities only

128. Why do international oral health policies often emphasize collaboration with sectors like education, agriculture, and finance?
(A) Oral health is unrelated to any other societal factors
(B) Collaboration ensures a multi-faceted approach to address underlying causes and improve overall health outcomes
(C) These sectors only provide clinical treatment
(D) It is more convenient to manage multiple sectors independently

129. All of the following measures align with WHO's approach to improving global oral health except:
(A) Promoting water fluoridation where feasible
(B) Advocating tobacco cessation to reduce oral cancer risk
(C) Encouraging sugary foods in school canteens
(D) Training primary healthcare workers in oral health screening

130. Which statement differentiates national oral health policies in developing nations from those in highly industrialized countries?
(A) Both focus solely on cosmetic improvements
(B) Developing countries often prioritize primary care access, while industrialized nations may emphasize advanced technologies and specialized treatments

(C) Industrialized countries do not require any oral health policies
(D) Developing nations concentrate only on building private dental colleges

131. A country struggles with high oral cancer rates, largely due to tobacco chewing. Which policy measure is most appropriate?
(A) Mandating daily fluoride mouthwash for everyone
(B) Subsidizing porcelain veneers
(C) Strengthening anti-tobacco legislation and incorporating oral screening in primary healthcare
(D) Providing free bleaching for extrinsic stains

132. If a national policy implements taxation on sugary drinks, which likely outcome would reduce caries prevalence?
(A) Lower purchase and consumption of sugar-rich beverages
(B) Increased preference for cigarettes
(C) Universal extraction of decayed teeth
(D) No change in dietary habits

133. Which core principle is integral to WHO's basic package of oral care in low-resource settings?
(A) Mandating expensive technology
(B) Eliminating free primary care services
(C) Emphasizing essential preventive and minimal invasive treatment approaches
(D) Providing comprehensive cosmetic services for everyone

134. Assertion (A): Integrating oral health into primary healthcare improves overall public health outcomes.
Reason (R): Oral health is isolated from systemic conditions, and collaboration with general health services is unnecessary.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

135. While drafting a new oral health policy, which step is incorrect in an evidence-based approach?
(A) Reviewing current epidemiological data
(B) Consulting multiple stakeholders, including dental professionals and community leaders
(C) Formulating strategies without evaluating available resources
(D) Piloting proposed interventions before widespread rollout

136. A 65-year-old in a rural village has had persistent bleeding gums and mobility in multiple teeth. Access to dental services is poor, and community health workers only visit infrequently. Local water is not fluoridated. On exam, severe periodontitis is confirmed. Which public health measure could help mitigate further tooth loss for this and similar cases?
(A) One-time specialized implant placement
(B) Routine training of local health workers in basic periodontal screening, hygiene instruction, and referral pathways
(C) Offering only cosmetic bleaching procedures
(D) Conducting advanced pulpectomy in remote settings

137. A 10-year-old child with multiple incipient carious lesions attends a school screening. The dentist suggests sealants and fluoride. Which best describes this level of prevention?
(A) Secondary
(B) Primary
(C) Tertiary
(D) Quaternary

138. A 40-year-old patient in a low-income urban neighborhood has advanced caries, missing posterior teeth, and no regular dental visits. The public health team wants to reduce such oral disease burdens citywide. What initial city-level strategy is most impactful?
(A) Mass distribution of advanced implants
(B) Periodic free check-up camps plus basic restorative services in community clinics

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(C) Mandating weekly bleaching sessions in local gyms
(D) Providing free crowns to each household

139. A newly graduated dentist aims to incorporate public health principles into daily private practice. What is the best initial step?
(A) Provide only high-end cosmetic procedures
(B) Dismiss any patient unable to pay
(C) Educate patients on preventive measures, nutritional guidance, and the importance of regular check-ups
(D) Offer free implants to everyone

140. Raising taxes on tobacco products is linked to a drop in oral cancer incidence. What is the likely causal pathway?
(A) Lower tobacco consumption reduces exposure to carcinogens, thereby reducing oral cancer risks
(B) Higher tobacco prices cause people to overuse sugar
(C) Tax increases result in no impact on tobacco habits
(D) People replace tobacco with bleaching agents

141. Assertion (A): Incorporating water fluoridation is a widely recognized public health measure.
Reason (R): It specifically benefits only those who can afford commercial fluoridated toothpaste.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

142. Which action is incorrect when conducting a school-based fluoride mouth rinse program?
(A) Securing parental consent
(B) Providing rinse instructions in local language
(C) Recording each student's participation daily
(D) Expecting one rinse session to last for multiple academic years without repetition

143. A local authority identifies high plaque indices among teenagers. Which immediate public health intervention is most directly aimed at lowering plaque accumulation across that age group?
(A) Implementing fluoride varnish on all teeth without plaque removal
(B) Mass distribution of sweetened beverages
(C) Organizing supervised brushing classes in schools
(D) Mandatory root planing for every adolescent

144. Which level of government typically shoulders the main responsibility for water fluoridation programs in most countries?
(A) National or federal government
(B) Private dental corporations
(C) Local or municipal authorities
(D) Pharmaceutical companies

145. Which describes the rationale behind providing minimal intervention dentistry (MID) in a public health context?
(A) To guarantee maximum profit through extensive procedures
(B) To preserve as much healthy tooth structure as possible and reduce healthcare costs
(C) To perform only cosmetic enhancements
(D) To deny any restorative treatment until severe damage occurs

146. A 30-year-old pregnant woman with limited dental access presents at a community clinic. She shows moderate gingivitis and early enamel lesions. The community dentist plans a simple, preventive-centered approach while educating her on the pregnancy-oral health link. Which management strategy best fits her scenario from a public health perspective?
(A) Immediate extraction of all questionable teeth
(B) Oral hygiene counseling, scaling, and topical fluoride application
(C) Referral to advanced implantology center
(D) No intervention until postpartum

147. A 55-year-old with poorly controlled diabetes arrives at a public health dental camp. Examination reveals advanced periodontal pockets, multiple missing teeth, and frequent episodes of dental abscesses. The dentist must balance his systemic condition with oral therapy choices. Which management aligns with public health objectives?
(A) Delay all treatment until blood sugar is fully normalized
(B) Educate on glycemic control, provide scaling/root planing, and arrange short-interval follow-ups
(C) Immediately place full-mouth implants
(D) Only provide analgesics without further intervention

148. A rural community sees high rates of edentulism in older adults due to unaffordable prosthetic care. A public health program seeks to improve their oral health-related quality of life. What measure is most appropriate initially?
(A) Setting up specialized implant centers in the capital
(B) Training local dental auxiliaries in atraumatic restorative treatment and basic removable prosthesis fabrication
(C) Launching mandatory cosmetic bleaching
(D) Providing only mouthwashes

149. Which guideline is frequently recommended when formulating a national oral health strategy?
(A) Ignoring WHO best practices
(B) Basing programs solely on anecdotal evidence
(C) Conducting a baseline national oral health survey to identify priority needs
(D) Restricting care to wealthier sections of society

150. An entire district faces alarmingly high childhood caries, minimal dental infrastructure, and a population reliant on local water sources without fluoride. Socioeconomic surveys reveal low income, poor literacy, and heavy dependence on sugary staples. The local government consults public health dentists for a multi-year intervention plan. Which set of measures best addresses this district's needs?
(A) Building a single high-tech clinic, ignoring community education
(B) Implementing water fluoridation where feasible, school-based sealant programs, and nutritional counseling
(C) Offering monthly extractions to all children
(D) Focusing exclusively on adult prosthodontic rehabilitation

151. Public Health can be defined as:
(A) Clinical services offered only in private hospitals
(B) Efforts to improve community health through organized initiatives and policy measures
(C) Enforcement of cosmetic dental procedures on a small population
(D) A system where each individual is responsible for self-funded healthcare

152. In dental public health, which global document or agenda highlighted the necessity of community-based disease prevention for all nations?
(A) Magna Carta
(B) Alma-Ata Declaration
(C) Kyoto Protocol
(D) Universal Declaration of Human Rights

153. Dental Public Health primarily focuses on:
(A) Increasing the profitability of private dental practices
(B) Lobbying against community water fluoridation
(C) Implementing population-based strategies to prevent and control oral diseases
(D) Replacing preventive programs with extensive cosmetic treatments

154. All of the following aims align with Public Health ideals except:
(A) Enhancing well-being at a population level
(B) Reducing inequalities in healthcare access
(C) Encouraging broad-based disease prevention
(D) Restricting health interventions to a wealthy minority

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155. Which statement contrasts Public Health and Clinical Practice in dentistry?
(A) Public Health focuses on communal disease prevention, while Clinical Practice targets individual patient treatment
(B) Both solely treat advanced oral pathologies
(C) Clinical Practice never involves patient-specific procedures
(D) Public Health lacks any preventive measures

156. A 20-year-old college student shows early enamel lesions on the occlusal surfaces. Which primary preventive approach is most appropriate to prevent progression?
(A) Full crowns for all posterior teeth
(B) Diet counseling and pit-and-fissure sealants
(C) Immediate extraction
(D) Frequent use of bleaching agents

157. A public health nurse in a fluoridated community advises parents to supervise toothbrushing in preschoolers. This step is an example of:
(A) Primary Prevention
(B) Secondary Prevention
(C) Tertiary Prevention
(D) Quaternary Prevention

158. Assertion (A): School-based fluoride mouth rinse programs can effectively reduce caries in children.
Reason (R): In such programs, children learn advanced periodontal surgeries.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

159. Which measure would be incorrect when initiating a community program for primary prevention of dental caries?
(A) Providing fluoride toothpaste to households
(B) Launching awareness drives on low-sugar diets
(C) Training local workers on oral health education
(D) Issuing guidelines for repeated tooth extractions among caries-free children

160. By instilling regular brushing and flossing habits from an early age, a community likely experiences:
(A) Increased prevalence of rampant caries
(B) Higher rates of advanced periodontal disease
(C) Reduced plaque accumulation and fewer carious lesions
(D) Worsening systemic health outcomes

161. Which index measures debris and calculus separately on specific tooth surfaces?
(A) DMFT
(B) CPITN
(C) OHI-S (Simplified Oral Hygiene Index)
(D) Gingival Index

162. The key action in the Gingival Index (Löe and Silness) is:
(A) Identifying missing teeth due to decay
(B) Scoring the gingiva based on color, consistency, and bleeding
(C) Locating calculus supra- and subgingivally
(D) Counting coronal restorations in each quadrant

163. How does the Community Periodontal Index (CPI) differ from DMFT?
(A) CPI focuses on periodontal status; DMFT measures caries experience
(B) Both exclusively track fluorosis
(C) CPI includes only filled teeth, while DMFT tracks calculus
(D) There is no difference in their usage

164. Assertion (A): The def index is essential for evaluating primary teeth caries in children.
Reason (R): def stands for decayed, edematous, and filled surfaces.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A

(C) A is true, but R is false
(D) A is false, but R is true

165. When using the CPI (Community Periodontal Index) in a field survey, which step is incorrect?
(A) Using a WHO probe to measure pocket depths
(B) Recording the highest score per sextant
(C) Including coronal caries lesions in the CPI record
(D) Checking for presence of bleeding and calculus

166. In epidemiological research, what is "external validity"?
(A) The extent to which findings apply only to the specific participants studied
(B) The test's ability to produce the same result repeatedly
(C) The degree to which results can be generalized to broader populations
(D) A measurement of how precisely a single tooth has been examined

167. Which study design follows a group without the outcome of interest forward in time to see who develops the condition?
(A) Cross-sectional study
(B) Cohort study
(C) Case-control study
(D) Ecological study

168. Why might a cross-sectional oral health survey be suboptimal for establishing causality between sugar consumption and caries?
(A) It measures exposure and outcome at the same time, not showing temporal sequence
(B) It only looks at national sugar production data
(C) It lacks any measurement of caries prevalence
(D) It requires multiple years of follow-up

169. Assertion (A): In dental research, randomized controlled trials (RCTs) are often regarded as high-level evidence.
Reason (R): RCTs cannot control for confounding variables at all.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

170. All of the following contribute to reducing bias in an oral health survey except:
(A) Calibrating examiners before data collection
(B) Using standardized indices like DMFT or CPI
(C) Recruiting only participants who are known to have advanced oral diseases
(D) Employing random sampling methods

171. A school finds multiple children with active caries. A dentist suggests a basic in-school intervention. Which step should be implemented first for a sustained program?
(A) Initiate routine fluoride mouth rinses with parental consent
(B) Instruct children to rinse with soda after meals
(C) Offer free bleaching sessions to older children
(D) Force daily use of advanced electric toothbrushes regardless of cost

172. A 9-year-old complains of recurrent tooth pain and is found to have multiple carious lesions. The school wants to prevent further decay for all students. What measure is most viable?
(A) Sealing non-carious fissures for at-risk children
(B) Monthly tooth extraction drives
(C) Providing sugar-based snacks
(D) Cosmetic veneers for front teeth

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173. A rural primary school with 400 students experiences high caries prevalence. The nearest dental facility is 50 kilometers away. A visiting dentist proposes weekly fluoride mouth rinse and teacher-led brushing demonstrations. What foundational step ensures program success?
(A) Immediate extraction of all decayed teeth
(B) Training teachers and obtaining parent buy-in
(C) Full-scale orthodontic screenings
(D) Monthly sedation dentistry camps

174. How do sporadic dental camps differ from sustained school oral health programs in reaching long-term outcomes?
(A) Sporadic camps ensure daily supervised brushing, whereas school programs do not
(B) Sustained school programs integrate continuous education and follow-up, while camps offer temporary relief without long-term reinforcement
(C) Both focus on acute surgical interventions only
(D) Neither addresses preventive strategies

175. Which key principle often underlies a nation's oral health policy framework?
(A) Maximizing out-of-pocket expenses for dental care
(B) Reducing access to preventive services in underserved areas
(C) Integrating preventive measures into primary care systems
(D) Isolating oral health services from general healthcare

176. Assertion (A): International guidelines encourage focusing on children and adolescents for caries prevention.
Reason (R): Early interventions can yield lasting benefits by establishing lifelong oral hygiene habits and reducing disease burden.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

177. All of the following are typical components of an international oral health policy statement except:
(A) Emphasis on preventive care
(B) Advocacy for water fluoridation or alternative fluoride delivery methods
(C) Prohibiting all forms of restorative treatments
(D) Encouraging tobacco cessation to reduce oral cancer

178. Why do national oral health policies prioritize underserved communities?
(A) They have consistently lower caries rates
(B) Dental manpower is usually concentrated in these areas
(C) These populations often face higher disease burdens due to limited access and socioeconomic barriers
(D) They exclusively require advanced cosmetic treatments

179. How do national oral health policies in high-income countries often differ from those in low-income settings?
(A) High-income countries focus entirely on extractions and ignore preventive care
(B) Low-income settings prioritize advanced implantology first
(C) High-income countries may emphasize complex, high-tech services once basic care is universal, while low-income areas concentrate on fundamental prevention and primary care access
(D) There is no difference, as all countries follow identical protocols

180. A developing nation sees a high incidence of oral diseases among rural populations. Which strategy best aligns with public health principles to enhance national oral health outcomes?
(A) Offer only cosmetic veneers in major cities
(B) Strengthen primary dental services with mid-level providers, deploy preventive programs (fluoridation, sealants), and establish referral systems

(C) Rely solely on private clinics without any public funding
(D) Implement mandatory daily tooth extraction for all adults

181. A 45-year-old construction worker reports difficulty chewing due to multiple untreated carious lesions. He lacks dental insurance and lives far from urban centers. The local health department finds similar patterns in many area residents. Which public health measure could address both the patient's immediate needs and the community's broader challenges?
(A) One-time donation of electric toothbrushes
(B) Provision of mobile dental clinics offering basic restorative services and preventive education in remote locations
(C) Invitation to a luxury clinic in the capital for advanced cosmetic treatments
(D) A policy banning all sugary foods without alternatives

182. A 28-year-old pregnant woman in her second trimester visits a community dental camp with bleeding gums and mild toothache. She has minimal dental knowledge and limited finances. The nearest hospital is 80 km away. A local dentist must address her complaints safely and align with public health guidelines. What intervention is ideal?
(A) Prescribe analgesics only
(B) Gentle scaling, plaque-control instruction, and conservative restoration of the painful tooth
(C) Immediate extraction of all painful teeth
(D) Advanced periodontal surgery under general anesthesia

183. A regional government notes rampant dental caries in primary schools and an overall shortage of dentists. They propose a multi-year strategy for sustainable improvement. After an initial pilot, they confirm results indicating high sugar intake and poor brushing. Which integrated policy is most apt?
(A) Deploy mid-level providers for routine care, introduce supervised brushing in schools, and legislate reduced sugar availability
(B) Fund only private clinics in urban centers
(C) Halt all preventive measures and rely on advanced surgeries
(D) Restrict oral health education exclusively to college students

184. A newly formed coalition for national oral health in a middle-income country must reduce high caries rates and promote prevention. Which action best exemplifies effective public health management?
(A) Legalizing sugary drinks in schools to boost revenue
(B) Training local nurses for basic dental screening, encouraging parental engagement, and offering fluoride solutions
(C) Closing all community clinics to focus on large city hospitals
(D) Providing cosmetic crowns free of charge to a small elite group

185. Which principle is often cited in WHO guidelines for creating equitable oral health systems?
(A) Restrict services to wealthy private clinics
(B) Provide universal coverage for essential preventive and restorative measures
(C) Mandate daily bleaching for all adults
(D) Prohibit mid-level provider training

186. In a population-based oral health survey, high rates of oral ulcers, suspicious growths, and widespread tobacco-chewing habits signal a red flag for:
(A) A surge in denture-related stomatitis
(B) Anxiety-driven tooth grinding
(C) Increased risk of oral pre-cancer and cancer
(D) Only benign mucosal lesions

187. Which key symptom in a population screening could prompt immediate referral for possible oral malignancy?
(A) Mild, transient tooth sensitivity to cold
(B) Painless, persistent ulceration or lump on the tongue or oral mucosa
(C) Occasional bleeding after vigorous brushing
(D) Brief jaw discomfort during chewing gum

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188. What is "Public Health Surveillance" in the context of dental public health?
(A) Monitoring only private dental office profits
(B) Continuous, systematic collection and analysis of data regarding oral diseases and risk factors to guide actions
(C) Isolated, one-time analysis of a single patient's treatment plan
(D) Random condemnation of non-fluoridated areas

189. How do local municipal oral health initiatives differ from national-level policies?
(A) Municipal initiatives handle direct implementation for smaller areas, while national policies set broader frameworks and regulations
(B) National policies never involve regulation or funding
(C) Local initiatives always eliminate the need for legislation
(D) Both are identical in scope and scale

190. A city health department wants to reduce high plaque scores among teenagers. Which immediate measure best addresses plaque buildup at scale?
(A) Launching supervised after-school brushing programs with routine plaque checks
(B) Providing only advanced periodontal surgeries
(C) Focusing on posterior implant placement for each teen
(D) Distributing sweets to encourage compliance

191. During a community oral examination, the dentist notices many adults with partial edentulism who cannot afford complex rehabilitations. Which public health-driven next step is most beneficial?
(A) Offering free bleaching sessions only
(B) Introducing low-cost removable partial dentures and preventive education
(C) Denying treatment to emphasize self-reliance
(D) Mandating root canal therapies for all missing teeth

192. Why is integrating oral health with general health services often emphasized in public health dentistry?
(A) Most oral diseases have no relation to systemic conditions
(B) It allows a coordinated approach to shared risk factors, such as diet and tobacco use
(C) It restricts healthcare professionals to specialize only in dentistry
(D) It increases duplication of diagnostic tests

193. In a population screening, a significant portion of older adults shows patchy, erythematous oral mucosal lesions that do not resolve with improved hygiene. This sign demands screening for:
(A) Denture-related stomatitis only
(B) Oral candidiasis or potential neoplastic changes
(C) Fractured alveolar bone
(D) Impacted wisdom teeth

194. A local government places restrictions on high-sugar snack advertising near schools. The likely effect is:
(A) No change in children's snacking habits
(B) Reduced sugar consumption among students, potentially lowering caries rates
(C) A surge in advanced restorative treatments
(D) Mandatory extractions for all students

195. A robust cross-sectional survey finds 60% of an adult population has untreated caries. Which statement about the likelihood of receiving restorative care is most logical?
(A) The data alone cannot predict individual treatment likelihood; it only indicates a high prevalence of unmet needs
(B) Exactly 60% will definitely get fillings next year
(C) It proves that all the others (40%) have no caries risk
(D) Everyone with caries will soon develop advanced periodontitis

196. A 50-year-old fisherman in a coastal village frequently consumes sweet tea and has multiple active carious lesions. He rarely visits the mainland dental clinic due to travel costs. A health outreach team aims to help him and others with similar constraints. Which strategy best supports immediate treatment and future prevention?

(A) Provide sugar-free sweeteners, mobile restorative services, and dietary advice on minimizing sugar
(B) Suggest advanced implant placement in the city
(C) Instruct him to stop brushing to allow natural healing
(D) Offer bleaching sessions for stained incisors

197. A public health researcher wants to identify the primary risk factors for rampant caries in a local population. Which initial investigation method would be most suitable?

(A) Ecological study comparing sugar sales across regions without individual data
(B) Case-control study comparing those with rampant caries to those without, examining prior exposures
(C) Single-patient clinical observation
(D) Randomized controlled trial of tooth brushing frequencies

198. The key action in an atraumatic restorative treatment (ART) program is:

(A) Using elaborate electric handpieces to prepare cavities
(B) Removing carious tissue manually and placing adhesive restorative material without mechanical drills
(C) Only bleaching superficial stains
(D) Demanding advanced sedation for all patients

199. All of the following reflect public health strategies to improve periodontal health except:

(A) Mass education campaigns on plaque control
(B) Community-level tobacco cessation initiatives
(C) Routine scaling services via local clinics
(D) Abolishing all prophylaxis to enhance natural healing

200. Assertion (A): National oral health programs reduce treatment costs in the long run.
Reason (R): They emphasize prevention and early intervention, lowering the need for extensive rehabilitative procedures.

(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

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CHAPTER 07

CONSERVATIVE DENTISTRY AND ENDODONTICS

1. What best defines the term "tooth preparation" in operative dentistry?
   (A) Reshaping the tooth for aesthetics
   (B) Removing tooth structure for crown placement
   (C) Creating an appropriate form to restore function
   (D) Polishing the tooth surface prior to restoration

2. Which classification primarily focuses on the location of carious lesions on the tooth surface?
   (A) G.V. Black's classification
   (B) Mount and Hume's classification
   (C) WHO classification
   (D) ICDAS classification

3. According to G.V. Black, a Class II cavity is found on:
   (A) Gingival third of facial or lingual surfaces
   (B) Proximal surfaces of posterior teeth
   (C) Proximal surfaces of anterior teeth
   (D) Incisal edges of anterior teeth

4. When comparing convergence and divergence of cavity walls, which statement is most accurate?
   (A) Convergent walls weaken retention
   (B) Divergent walls help with marginal seal
   (C) Convergent walls generally increase retention form
   (D) Divergent walls completely prevent microleakage

5. Which of the following is the best initial step in cavity preparation for an extensive Class II lesion?
   (A) Final finishing of enamel margins
   (B) Removal of unsupported enamel
   (C) Establishment of outline form
   (D) Placement of final restorative material

6. A patient presents with a wide occlusal carious lesion in a lower first molar. Which fundamental principle is crucial in preventing restoration fracture during mastication?
   (A) Convenience form
   (B) Resistance form
   (C) Outline form
   (D) Retention form

7. All of the following are objectives of internal wall preparation in cavity design except:
   (A) Adequate depth for restorative material
   (B) Parallel or slightly convergent walls
   (C) Reduction of healthy cusps
   (D) Smooth internal line angles

8. Excessive divergence of occlusal cavity walls may lead to:
   (A) Increased retention and resistance
   (B) Enhanced marginal seal
   (C) Greater risk of restoration dislodgement
   (D) No significant effect on restoration longevity

9. Which step is incorrect when establishing the final shape in a Class I preparation on a molar?
   (A) Refining internal line angles
   (B) Removing remaining caries
   (C) Cutting a beveled cavosurface margin on occlusal enamel
   (D) Ensuring sufficient pulpal depth

10. Assertion: Dentists often create divergent proximal walls in Class II preparations for convenience.
    Reason: Divergent walls reduce potential undercuts and improve matrix band placement in posterior restorations.
    (A) Both Assertion and Reason are true, and Reason is the correct explanation.

(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

11. Which instrument is commonly used to place retention grooves in cavity preparations?
(A) Spoon excavator
(B) Enamel hatchet
(C) Gingival margin trimmer
(D) Round bur in a handpiece

12. For a Class V cervical abrasion lesion requiring restoration, the primary retention form is achieved by:
(A) Convergent incisal and gingival walls
(B) A retentive groove at the occlusal margin only
(C) Bonding alone without any mechanical retention
(D) Tapered preparation allowing movement of material

13. A 35-year-old with moderate occlusal caries in a mandibular molar requires a conservative Class I preparation. What feature helps resist fracture of the tooth and restoration under occlusal load?
(A) Rounded line angles
(B) Sharp cavosurface margins
(C) Shallow pulpal floor
(D) Excessive divergence

14. When performing a slot preparation for a Class II lesion, one key action is:
(A) Creating a wide occlusal extension regardless of caries
(B) Leaving behind all affected dentin
(C) Preserving marginal ridge if structure is intact
(D) Overextending facial and lingual walls

15. According to modern minimally invasive guidelines, the primary goal during tooth preparation is to:
(A) Remove all discolored tooth structure
(B) Achieve maximum width for the cavity
(C) Retain as much healthy tooth structure as possible
(D) Provide mechanical undercuts in every scenario

16. In a large Class II amalgam preparation with weakened cusps, the decision to include cusp coverage is made primarily to:
(A) Improve esthetics
(B) Maximize the contact point
(C) Increase retention solely
(D) Prevent cusp fracture under function

17. A patient complains of sharp pain on biting in a tooth with a freshly placed restoration. Which preparation factor might be implicated?
(A) Optimal pulpal depth
(B) Rounded internal line angles
(C) High occlusal contact or premature contact
(D) No occlusal contact

18. Conventional hand-cut preparations versus air-abrasion cavity preparations differ mainly in:
(A) Amount of healthy tooth preserved
(B) Use of diamond burs
(C) Requirement for isolation
(D) Ability to remove enamel rods

19. In assessing a suspected Class I cavity, which finding is a red flag suggesting hidden dentinal caries?
(A) Minimal staining in the central fossa
(B) Radiolucency beneath an apparently intact occlusal surface
(C) A shallow pit with no underlying discoloration
(D) No symptoms reported by the patient

20. Which diagnostic tool most accurately detects the presence of fissure caries before they become radiographically visible?
(A) Tactile exploration with a sharp explorer
(B) Dye staining
(C) Laser fluorescence device (e.g., DIAGNOdent)
(D) Visual inspection under normal light

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21. Which statement best defines a dental liner in restorative procedures?
(A) A thick restorative material replacing tooth structure
(B) A thin coating placed to protect the pulp
(C) A finishing material for final polish
(D) An abrasive compound for cleaning cavities

22. Which of the following describes the main function of a "base" under a restoration?
(A) Reducing the need for enamel bonding
(B) Providing bulk support and thermal protection
(C) Improving the finish of the restoration
(D) Acting primarily as a bonding agent

23. Which material is least likely to be used as a liner?
(A) Calcium hydroxide
(B) Zinc oxide eugenol
(C) Glass ionomer cement
(D) Composite resin

24. All of the following are benefits of using calcium hydroxide liners except:
(A) Promotion of secondary dentin formation
(B) Neutralizing the acidic components of cements
(C) Strong compressive strength comparable to dentin
(D) Providing a bacteriostatic environment

25. Assertion: Zinc oxide eugenol (ZOE) can be placed as a base under a composite restoration.
Reason: Eugenol can interfere with composite resin polymerization.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is false, but Reason is true.
(D) Assertion is true, but Reason is false.

26. A deep Class I cavity with potential pulp exposure requires which lining strategy?
(A) No liner at all
(B) A thick composite resin as a base
(C) A thin layer of calcium hydroxide covered by a stronger base
(D) Pure zinc oxide eugenol only

27. Which liner or base material has the best fluoride-releasing property?
(A) Polycarboxylate cement
(B) Glass ionomer cement
(C) Zinc phosphate cement
(D) Calcium hydroxide paste

28. Why is resin-modified glass ionomer often preferred over conventional glass ionomer as a base?
(A) It completely removes the need for liner
(B) It polymerizes without moisture control
(C) It combines some resin properties with fluoride release
(D) It is entirely unaffected by oral fluids

29. A 22-year-old patient presents with a large occlusal cavity near the pulp. You decide on a two-layer approach: a calcium hydroxide liner plus a second material for better strength and fluoride release. Which material is most appropriate to place over the liner before the final restoration?
(A) Zinc oxide eugenol
(B) Glass ionomer cement
(C) Polycarboxylate cement
(D) Amalgam

30. After placing a liner in a tooth with near-pulpal exposure, the best next step in managing the preparation is to:
(A) Fill the entire cavity immediately with glass ionomer
(B) Condense amalgam directly on the liner
(C) Add a suitable base to reinforce the liner if needed
(D) Apply the final varnish and dismiss the patient

31. When using zinc phosphate as a base under an amalgam restoration, which preliminary measure is crucial?
(A) Exposing the pulp intentionally
(B) Lining with calcium hydroxide if dentin is very thin
(C) Omission of any liner or varnish
(D) Using a resin bonding agent directly on the dentin

32. In applying a protective liner in a deep cavity, which step would be incorrect?
(A) Placing liner only on the axial and pulpal floors
(B) Using a minimal thickness layer
(C) Extending liner up the cavity walls to the cavosurface
(D) Ensuring complete set before placing the next layer

33. Which base or liner is commonly known for forming a chemical bond with tooth structure?
(A) Zinc phosphate cement
(B) Polycarboxylate cement
(C) Glass ionomer cement
(D) Gutta-percha

34. A 45-year-old patient has a large cervical lesion with near-pulpal involvement on tooth #24. Radiographs show minimal remaining dentin. The dentist plans a two-step approach with a liner and a base to preserve pulp vitality. Which base is recommended?
(A) Polycarboxylate cement
(B) Resin-modified glass ionomer cement
(C) Zinc oxide eugenol
(D) Zinc phosphate cement

35. Which statement correctly contrasts the use of varnish and bonding agents in cavity preparations?
(A) Both are identical in composition
(B) Varnish is primarily used with composite, while bonding agents are used with amalgam
(C) Bonding agents chemically adhere to tooth structure, varnish merely provides a physical seal
(D) Varnish prevents microleakage in composite better than bonding agents

36. All of the following statements about resin bonding agents are true except:
(A) They enhance retention of composite restorations
(B) They eliminate the need for mechanical undercuts
(C) They provide excellent thermal insulation
(D) They reduce microleakage when properly used

37. A patient with a deep occlusal cavity complains of sensitivity to cold after an amalgam filling. Which liner's absence might be the probable cause for thermal conduction?
(A) Calcium hydroxide
(B) Zinc oxide eugenol
(C) Glass ionomer cement
(D) Varnish

38. A patient with a newly placed large composite restoration experiences postoperative sensitivity. Which step could have been missed that commonly prevents microleakage at the gingival margin?
(A) Placement of a thick zinc phosphate base
(B) Meticulous application of a bonding agent
(C) Omission of light-curing
(D) Abrasion of the gingival margin with coarse diamond

39. Assertion: A resin-modified glass ionomer base can be used under composite restorations.
Reason: Resin-modified glass ionomer may bond to both tooth and composite.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is false, but Reason is true.
(D) Assertion is true, but Reason is false.

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40. A 55-year-old patient reports persistent discomfort after receiving a large Class II resin composite restoration on tooth #15. Radiographs show no obvious gap, but a slight radiolucency near the gingival margin. The dentist suspects microleakage due to inadequate seal and partial de-bonding, especially in the proximal box. On re-examination, the dentist notes the absence of a protective base layer, despite the cavity's proximity to the pulp. Which would have been the most suitable material to provide both a seal and fluoride release in this scenario?
(A) Resin-modified glass ionomer
(B) Zinc oxide eugenol
(C) Polycarboxylate cement
(D) Compomer

41. Which method is considered least reliable for early detection of occlusal caries?
(A) Visual inspection under adequate lighting
(B) Laser fluorescence caries detection device
(C) Tactile probing with a sharp explorer
(D) Fiber-optic transillumination

42. Minimally Invasive Dentistry (MID) for caries removal emphasizes:
(A) Complete removal of stained dentin
(B) Preserving affected dentin that can remineralize
(C) Widening the preparation for better access
(D) Always including the entire pit and fissure system

43. Why might a dentist leave some softened dentin in a deep cavity while restoring?
(A) To avoid the time-consuming procedure of complete excavation
(B) To ensure better mechanical retention
(C) To promote secondary dentin formation and reduce pulp exposure risk
(D) To keep the tooth weaker for subsequent restorative replacements

44. A 28-year-old patient presents with diffuse, non-specific pain emanating from the posterior quadrant. Radiographic examination reveals a small radiolucency limited to the enamel on the first molar, with no visible dentinal involvement. The dentist decides to follow a conservative approach, placing a sealant rather than performing a traditional cavity preparation. This approach illustrates which principle of modern caries management?
(A) Surgical intervention at the earliest sign of decay
(B) Sealing incipient lesions to arrest caries progression
(C) Removal of all carious and stained enamel
(D) Retrofitting existing fillings for prophylaxis

45. Which statement best differentiates infected dentin from affected dentin?
(A) Infected dentin can be remineralized; affected dentin must be removed
(B) Infected dentin is irreversibly demineralized; affected dentin may be remineralized
(C) Both infected and affected dentin are equally salvageable
(D) Both infected and affected dentin must be fully removed for restoration

46. When managing a moderate Class I carious lesion, a dentist practicing minimal intervention would:
(A) Extend the preparation to include all fissures regardless of lesion extent
(B) Remove only irreversibly infected dentin
(C) Routinely place an indirect pulp cap
(D) Always use an aggressive funnel-shaped preparation

47. A 40-year-old patient has an interproximal carious lesion in the premolar. Radiographs confirm dentinal involvement but no pulpal encroachment. You decide on a conservative approach, removing caries selectively. After excavation, the remaining dentin is slightly discolored but firm. Which course of action aligns with modern caries management?
(A) Completely remove all discolored dentin
(B) Place a liner if near the pulp and restore

(C) Immediate root canal therapy
(D) Observe without restoration

48. Assertion: Visual-tactile caries detection alone may miss early enamel caries.
Reason: Bitewing radiographs can detect incipient proximal lesions not clinically visible.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

49. Which step is incorrect when performing caries excavation in a deep lesion close to the pulp?
(A) Initial removal of peripheral infected dentin
(B) Leaving some stained but firm dentin near the pulp
(C) Using a sharp spoon excavator for final checks
(D) Completely flattening the pulpal floor to remove all softened dentin

50. A clinical exam finds caries in a lower first molar, extending into the dentin but not reaching the pulp. According to minimally invasive principles, the dentist should:
(A) Remove all discolored dentin aggressively
(B) Stop caries removal once firm, affected dentin is reached
(C) Prepare the tooth for full-coverage crown
(D) Perform prophylactic Class II preparation in the adjacent second molar

51. Which statement best defines a dental amalgam restoration?
(A) A single-component resin placed in posterior teeth
(B) A direct restorative material combining mercury with alloy powder
(C) A purely ceramic restoration bonded to enamel
(D) A plastic filling that sets through photopolymerization

52. Which of the following phases in a set dental amalgam is most prone to corrosion?
(A) Gamma (Ag3Sn)
(B) Gamma-1 (Ag2Hg3)
(C) Gamma-2 (Sn8Hg)
(D) Eta (Cu6Sn5)

53. High-copper amalgams are considered superior to low-copper amalgams primarily because they:
(A) Have a higher mercury content
(B) Generate more gamma-2 phase
(C) Reduce weak phases and improve corrosion resistance
(D) Completely eliminate mercury

54. All of the following are advantages of amalgam restorations except:
(A) Good compressive strength
(B) Ease of placement in moist environments
(C) Excellent esthetics for anterior teeth
(D) Cost-effectiveness

55. When comparing the condensation of an amalgam restoration to the placement of a composite restoration, which statement is accurate?
(A) Both rely solely on chemical bonding to tooth structure
(B) Amalgam requires mechanical retention; composite relies on adhesion
(C) Composite is compressed with heavy hand pressure
(D) Amalgam is light-cured to polymerize the restorative material

56. A posterior tooth with wide buccolingual dimensions is restored using amalgam. Which step is critical to ensure minimal porosity within the amalgam and optimum strength?
(A) Relying on slow, passive placement
(B) Using high-volume suction constantly
(C) Condensing the amalgam in small increments
(D) Leaving the amalgam unburnished

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57. Which strategy best limits postoperative sensitivity in an amalgam restoration placed in deep dentin?
(A) Using a resin-based bonding system under the amalgam
(B) Eliminating a base or liner to reduce material layers
(C) Inserting amalgam without condensation
(D) Polishing the restoration immediately after placement

58. What key action ensures better marginal seal of an amalgam restoration after final set?
(A) Leaving the matrix band in place permanently
(B) Burnishing the margins after 24 hours
(C) Applying a thin layer of composite resin on top
(D) Overheating the amalgam during trituration

59. A large Class II amalgam restoration on a first molar has a partially fractured marginal ridge six months post-placement. The best management approach is:
(A) Replace the entire restoration immediately
(B) Place a new crown due to failure
(C) Recontour and repair the marginal ridge with composite
(D) Evaluate if a partial repair with amalgam is feasible

60. Overtriturating dental amalgam can cause:
(A) A very dry, crumbly mix
(B) A soupy, weak mix
(C) A complete absence of corrosion
(D) Immediate evaporation of mercury

61. What best defines a composite resin restoration?
(A) A combination of resin matrix and silica-based filler particles
(B) A water-based cement releasing fluoride
(C) A metal alloy mixed with mercury
(D) A purely glass particle matrix with calcium hydroxide

62. Which component in a light-cured composite initiates polymerization upon exposure to blue light?
(A) Hydroquinone
(B) Tertiary amine
(C) Camphorquinone
(D) Benzoyl peroxide

63. Why is incremental placement of composite resin recommended?
(A) To speed up finishing and polishing
(B) To allow water absorption from each layer
(C) To reduce polymerization shrinkage and improve curing depth
(D) To mimic the technique used for amalgam condensation

64. All of the following are advantages of composite restorations except:
(A) Better esthetics than amalgam
(B) Potential for conservative cavity preparation
(C) Simple one-step placement in very deep cavities
(D) Bonding to tooth structure for retention

65. When comparing self-etch adhesive systems to total-etch systems for composite restorations, which statement is correct?
(A) Self-etch systems always produce stronger enamel bonds
(B) Total-etch systems eliminate the need for rinsing
(C) Self-etch systems combine etching and priming in one step
(D) Total-etch systems cannot bond to dentin

66. A clinician notices marginal discoloration around a one-year-old composite. This is most likely due to:
(A) Optimal bonding procedure
(B) Inadequate moisture control leading to microleakage
(C) Removal of the smear layer with phosphoric acid
(D) Use of high-viscosity flowable resin

67. Which approach best addresses polymerization shrinkage stress in a large Class II composite restoration?
(A) Bulk-filling the entire box with one light-curing cycle
(B) Using incremental layering with oblique placement
(C) Skipping bonding agent to allow freedom of movement
(D) Leaving the restoration partially cured intentionally

68. A newly placed composite in a posterior tooth shows immediate postoperative sensitivity to cold beverages. The likely cause is:
(A) Insufficient finishing and polishing
(B) Contamination during placement causing microleakage
(C) Decreased thermal conductivity of composite
(D) Complete curing of the bonding agent

69. According to established bonding protocols for posterior composites, which step is critical?
(A) Placing a matrix band and wedge to achieve proper contact
(B) Preparing wide undercuts in dentin
(C) Omitting the etching step when enamel is present
(D) Using eugenol-based liners directly under composite

70. A Class II composite restoration presents with an open contact. The best management is to:
(A) Add flowable composite at the marginal gap
(B) Re-burnish the contact with an amalgam condenser
(C) Remove and replace the restoration to establish correct contact
(D) Widen the embrasure with a polishing bur

71. A patient with a newly placed composite experiences lingering pain when biting down. Which red flag finding might indicate a high occlusion rather than pulpitis?
(A) Heat sensitivity persisting for more than 30 seconds
(B) Radiographic evidence of periapical radiolucency
(C) Persistent sensitivity only with heavy biting forces
(D) Fever and swollen lymph nodes

72. A 45-year-old patient has recurrent decay under a 2-year-old posterior composite. Radiographs reveal marginal breakdown at the gingival floor. The dentist suspects contamination during placement. Which factor most commonly leads to failure when bonding composite in posterior teeth?
(A) Overdrying dentin
(B) Excessive phosphoric acid concentration
(C) Saliva contamination
(D) Insufficient filler in the composite

73. Assertion: Flowable composites are used as a liner under posterior restorations.
Reason: Flowable composites exhibit low elasticity, preventing stress absorption at the cavity floor.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

74. Which statement best defines a glass ionomer cement (GIC) restoration?
(A) A metal-based alloy that sets through amalgamation
(B) A resin-based restoration lacking fluoride release
(C) A water-based cement that chemically bonds to tooth and releases fluoride
(D) A purely porcelain restoration fired at high temperature

75. Which property of conventional glass ionomer cement is most beneficial in high-caries-risk patients?
(A) Superior compressive strength to amalgam
(B) Ability to release fluoride

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(C) Immediate light-curing
(D) Extremely high bond strength to unetched enamel

76. Why is resin-modified glass ionomer cement (RMGIC) often preferred over conventional GIC for restorations in stress-bearing areas?
(A) It eliminates the fluoride release
(B) It has improved mechanical strength due to resin polymerization
(C) It doesn't require any moisture control
(D) It needs no light-curing

77. All of the following are indications for using glass ionomer cement restorations except:
(A) Class V cervical lesions
(B) Primary teeth restorations in children
(C) Class I in heavy occlusal load areas in adults
(D) Sandwich technique under composite

78. When comparing GIC to composite resin restorations, which statement is correct?
(A) Both materials rely on the same polymerization shrinkage mechanism
(B) GIC typically has lower compressive strength but offers fluoride release
(C) Composite chemically bonds to tooth without a bonding agent
(D) GIC needs complete dryness like composite resin

79. A cervical lesion on a premolar extends onto the root surface, challenging moisture control. Which restorative material is best suited to ensure bonding and reduce caries risk?
(A) Amalgam
(B) Ceramic inlay
(C) Glass ionomer cement
(D) Direct gold foil

80. When performing a "sandwich technique," a key feature is:
(A) Placing composite on the deepest pulpal floor and GIC at the surface
(B) Bonding glass ionomer to the tooth and covering it with composite
(C) Using only flowable resin in between two layers of amalgam
(D) Curing the GIC and composite together in one step

81. What is the best definition of a dental inlay?
(A) A direct restoration placed chairside
(B) A prefabricated pin used for retention
(C) An indirect restoration fitting within the confines of the cusps
(D) A restoration extending over one or more cusps

82. Which material is commonly used for fabricating laboratory-processed inlays?
(A) Unset glass ionomer
(B) Porcelain or ceramic
(C) Zinc oxide eugenol
(D) Uncured polycarboxylate

83. Why might a dentist choose an inlay rather than a direct composite for a large MOD restoration?
(A) Inlays are always cheaper than composites
(B) Inlays can offer superior control of contours and contacts
(C) Composites cannot bond to enamel
(D) Inlays do not require any tooth preparation

84. All of the following are potential advantages of an inlay restoration except:
(A) Precise proximal contacts
(B) Opportunity for superior occlusal anatomy
(C) No need for a temporary restoration
(D) Reduced polymerization shrinkage in the mouth

85. Inlays differ from onlays primarily in:
(A) The composition of the restorative material
(B) The extent of cuspal coverage
(C) Whether they are direct or indirect restorations
(D) The shade-matching technique

86. A premolar with a fractured cusp has enough healthy structure to preserve a small occlusal portion but needs coverage for one cusp. Which restoration is most appropriate?
(A) Full coverage crown
(B) Inlay
(C) Onlay
(D) Class I composite

87. Which factor most commonly influences the decision to choose an onlay instead of a full crown?
(A) Patient's desire to use more gold
(B) The location of the tooth (anterior vs. posterior)
(C) Extent of tooth structure remaining to retain partial coverage
(D) Speed of the laboratory fabrication process

88. Following onlay placement, a patient complains of pain on biting specifically on the restored tooth. A key sign suggesting occlusal discrepancy is:
(A) Pain that increases at night without stimulus
(B) Radiographic detection of open margins
(C) Discomfort only when the patient fully occludes
(D) Spontaneous throbbing pain lasting 30 minutes

89. A patient with a newly placed ceramic inlay returns complaining of sensitivity to sweet foods and cold liquids. Which red flag finding might point toward marginal leakage?
(A) Visible gap at the interface on close inspection
(B) Low restoration margins subgingivally
(C) No change in symptoms with biting pressure
(D) Rapid onset of severe throbbing pain

90. According to standard guidelines for indirect restorations, which step is crucial for bonding a ceramic onlay to tooth structure?
(A) Using eugenol-based temporary cement that remains in place
(B) Etching the ceramic surface with hydrofluoric acid and applying silane
(C) Permanently sealing the tooth with polycarboxylate cement prior to onlay placement
(D) Substituting the bonding agent with petroleum jelly

91. An onlay margin has a minor marginal gap but the restoration is otherwise intact. Which is the best management if isolation is achievable?
(A) Full restoration replacement
(B) Localized repair using a flowable composite or resin cement
(C) Extraction of the tooth
(D) Placement of an amalgam overlay

92. Assertion: A ceramic onlay may exhibit a better occlusal morphology than a direct composite filling.
Reason: Laboratory or digital fabrication allows more precise contouring than freehand shaping in the mouth.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is false, but Reason is true.
(D) Assertion is true, but Reason is false.

93. A 60-year-old patient presents with a large MOD restoration in a lower first molar that has fractured partially, sparing one cusp. The tooth has mild sensitivity but no pulp involvement. After thorough examination, the dentist plans to place an onlay rather than a full crown. The lab-fabricated onlay is made of lithium disilicate for esthetics and strength. Before cementation, the dentist gently air-abrades the tooth surface and uses hydrofluoric acid plus silane on the onlay's intaglio. Which final cement is typically recommended for bonding a ceramic onlay?
(A) Zinc phosphate cement
(B) Glass ionomer cement
(C) Resin cement
(D) Zinc oxide eugenol

94. How is an onlay best defined?
(A) A full-coverage crown placed on posterior teeth
(B) An indirect restoration that replaces the occlusal surface and includes one or more cusps

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(C) A pin-retained amalgam in the cervical region
(D) A direct, flowable composite material for incisal edges

95. When fabricating an indirect ceramic onlay, which step generally occurs first?
(A) Cementing the onlay onto the tooth
(B) Taking an impression or digital scan of the prepared tooth
(C) Final polishing of the occlusal surface
(D) Checking proximal contact with floss

96. Why are high-strength ceramics (like lithium disilicate) favored for onlays compared to feldspathic porcelain?
(A) They are more prone to fracture
(B) They require no bonding protocol
(C) They offer superior flexural strength for stress-bearing areas
(D) They cannot be milled using CAD/CAM systems

97. All of the following statements about onlay restorations are correct except:
(A) They require a bonding or cementation process
(B) They are used when one or more cusps need coverage
(C) They are fabricated indirectly
(D) They are always cheaper and faster than direct composite fillings

98. A 35-year-old patient presents with a defective MOD composite in the upper first molar. The cusps are intact but slightly weakened. The dentist decides that a ceramic inlay could provide stronger contacts and improved longevity. After removing the old restoration, the dentist prepares the cavity, ensuring divergence of the walls for an indirect restoration. The final impression is sent to the lab. Which factor is most crucial to ensure an accurate fit for the inlay upon delivery?
(A) Immediate final polishing
(B) Precise occlusal reduction of 4–5 mm
(C) Detailed impression and stable provisional
(D) Carving a deep retentive groove

99. During a follow-up appointment, a two-year-old ceramic inlay shows discoloration at the margins. No secondary caries is visible, and the restoration is intact. This discoloration most likely indicates:
(A) Failed bonding and recurrent decay
(B) Possible microleakage or external staining at the interface
(C) A strong chemical bond preventing any leakage
(D) A need for immediate extraction of the tooth

100. A large ceramic onlay is found to have a slight open contact on the mesial side. Occlusion is fine, and there is no recurrent caries. The best management is:
(A) Attempt an additive resin contact repair if feasible
(B) Dismiss the patient since there is no problem
(C) Perform pulpectomy to resolve the open contact
(D) Replace the entire onlay regardless of symptoms

101. What best describes a pulpotomy procedure in vital pulp therapy?
(A) Complete removal of the coronal and radicular pulp
(B) Surgical excision of only the root apex
(C) Partial or complete removal of the coronal pulp with preservation of radicular pulp vitality
(D) Extraction of the entire tooth with minimal trauma

102. Which material is most often used during a pulpotomy to encourage radicular pulp healing?
(A) Zinc oxide eugenol
(B) Mineral trioxide aggregate (MTA)
(C) Dental amalgam
(D) Gutta-percha

103. What is the main goal of a pulpotomy in a permanent tooth with reversible pulpitis?
(A) To fully instrument and obturate the canal space
(B) To remove all tooth structure and place a crown
(C) To retain healthy radicular pulp function and avoid full root canal therapy
(D) To prepare the tooth for extraction in the future

104. All of the following are indications for a pulpotomy in a permanent tooth except:
(A) Recent traumatic exposure of the coronal pulp
(B) Deep caries with reversible pulpitis
(C) Irreversible pulpitis extending into the radicular pulp
(D) Vital radicular pulp with minimal bleeding

105. How does a pulpectomy differ from a pulpotomy in vital pulp therapy?
(A) Pulpotomy involves removing only root pulp
(B) Pulpectomy removes the entire pulp, both coronal and radicular
(C) Pulpectomy preserves the coronal pulp
(D) Pulpotomy requires multiple visits, whereas pulpectomy is completed in one visit

106. When faced with a necrotic pulp in a young permanent tooth with open apices, the best initial step is:
(A) Immediate pulpotomy
(B) Pulpectomy followed by conventional root canal obturation
(C) Non-surgical extraction and implant placement
(D) Pulpectomy and apexification or revascularization procedure

107. A 10-year-old patient has deep caries in a mandibular first molar with a vital but inflamed coronal pulp. The radiograph shows open apices. Which procedure is most suitable to preserve pulp vitality for continued root development?
(A) Full pulpectomy and gutta-percha obturation
(B) Pulpotomy with a suitable medicament like MTA
(C) Extraction and space maintainer placement
(D) Apicoectomy on the tooth

108. During a pulpotomy in a permanent molar, the radicular pulp exhibits profuse bleeding that doesn't subside with pressure. What is the best next step?
(A) Proceed with a standard pulpotomy medicament
(B) Convert to a full pulpectomy (root canal therapy)
(C) Place glass ionomer over the bleeding pulp
(D) Finish the procedure anyway and restore the tooth

109. A key action when placing calcium hydroxide for apexification in a necrotic tooth is:
(A) Using a thick final composite layer immediately
(B) Achieving a tight coronal seal to prevent contamination
(C) Keeping the tooth permanently unfilled at the canal orifice
(D) Avoiding any radiographic follow-up until the apex closes

110. In performing a pulpectomy for apexification, which step would be incorrect?
(A) Removal of all necrotic pulp tissue
(B) Placing calcium hydroxide or MTA in the canal
(C) Sealing the canal orifice with a temporary restoration
(D) Obturation with gutta-percha at the first appointment despite the open apex

111. In a young permanent tooth, leaving necrotic pulp untreated can lead to:
(A) Further root development and strengthening of tooth structure
(B) Resolution of infection without any intervention
(C) Continued apex closure and normal pulp function

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(D) Arrested root development and possible periapical pathology

112. Which red flag finding would contraindicate a straightforward pulpotomy in a permanent tooth with deep caries?
(A) Short-lived, mild pain to cold
(B) Slight bleeding upon coronal pulp exposure
(C) Radiographic evidence of a large periapical radiolucency
(D) Vital radicular pulp on electric pulp testing

113. Assertion: Apexification is performed in teeth with open apices and necrotic pulp.
Reason: Apexification induces continued root elongation and normal pulp function in necrotic teeth.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

114. A 9-year-old has an accidental pulp exposure during cavity excavation on a primary molar. The radicular pulp appears healthy. Which vital pulp therapy approach is recommended for the primary tooth?
(A) Pulpotomy
(B) Pulpectomy
(C) Extraction
(D) Direct pulp capping

115. A teenager presents with persistent pain in a maxillary central incisor that sustained trauma months ago. Examination reveals an open apex and necrotic pulp. The dentist decides to initiate a revascularization approach. What is the main reason for choosing revascularization over traditional apexification in this scenario?
(A) To induce an apical hard tissue barrier passively
(B) To allow root walls to thicken and continue normal development
(C) To avoid any instrumentation in the canal
(D) To facilitate immediate placement of gutta-percha

116. A 12-year-old patient reports intermittent pain in a mandibular second premolar with open apex. Radiographs reveal necrotic pulp and a periapical radiolucency. The dentist proceeds with a pulpectomy, disinfecting the canal thoroughly. Which material is placed next for apexification?
(A) Glass ionomer
(B) Composite resin
(C) Calcium hydroxide or MTA
(D) Zinc oxide eugenol

117. A 14-year-old with a partially formed maxillary canine presents for assessment after a sports injury. The tooth is tender to percussion, and a radiograph shows an open apex. Electric pulp testing suggests necrosis. The dentist performs a thorough canal debridement and irrigation with sodium hypochlorite, attempting to keep instrumentation minimal. An intracanal medication is placed, followed by a sterile dressing. The dentist advises revascularization instead of classic apexification. What fundamental benefit does revascularization offer in this specific scenario of open apex and necrotic pulp?
(A) Immediate obturation with gutta-percha
(B) Formation of thicker dentinal walls and further root development
(C) Simplified single-step final restoration
(D) Complete avoidance of intracanal irrigants

118. Which statement best defines root canal therapy (RCT)?
(A) Filling a tooth's crown with amalgam
(B) Removing diseased or necrotic pulp tissue, disinfecting canals, and obturating them
(C) Placing a direct gold restoration in the pulp chamber
(D) Sealing the coronal aspect only with no instrumentation

119. Which file system uses a rotating action with a nickel-titanium alloy for canal shaping?
(A) K-files in a push-pull motion

(B) Hedstrom files used manually
(C) Rotary NiTi files
(D) Barbed broaches

120. Why is sodium hypochlorite favored as an irrigant in root canal therapy?
(A) It is a purely lubricating agent with no antimicrobial effect
(B) It dissolves vital and necrotic tissue while disinfecting
(C) It cannot remove the smear layer
(D) It is used only for final rinse

121. All of the following are objectives of canal shaping in RCT except:
(A) Creating a taper that facilitates obturation
(B) Preserving the original canal path
(C) Aggressively removing healthy periapical tissue
(D) Eliminating residual pulp tissue and debris

122. When comparing lateral condensation and warm vertical condensation techniques for gutta-percha obturation, which statement is correct?
(A) Lateral condensation relies on heat to soften the core
(B) Warm vertical condensation uses accessory cones in multiple increments
(C) Lateral condensation involves placing a master cone and spreading with accessory cones
(D) Both techniques require no sealer for the canal space

123. A clinician aims for a denser obturation with minimal voids in a moderately curved canal. Which obturation technique would most likely be chosen for superior adaptation?
(A) Cold lateral condensation
(B) Warm vertical condensation
(C) Single cone with sealer only
(D) Silver point obturation

124. Which action best ensures adequate apical seal during obturation?
(A) Ignoring the working length and overfilling the canal
(B) Carefully determining working length to avoid overextension
(C) Using no sealer to prevent mixing with gutta-percha
(D) Leaving a large void at the apex for drainage

125. A patient complains of lingering pain after root canal obturation. Radiographs show a slight overextension of gutta-percha beyond the apex. Which symptom strongly suggests an overfilled canal is causing periapical irritation?
(A) Sharp pain subsiding quickly after cold testing
(B) Intermittent mild pressure sensitivity
(C) Persistent, dull throbbing in the periapical area
(D) No pain but occasional clicking sensation

126. Per current endodontic guidelines, which step is critical to minimize post-operative flare-ups after root canal instrumentation?
(A) Leaving canals completely unmedicated
(B) Thorough chemo-mechanical debridement and intracanal medicament if needed
(C) Overextending files to enlarge the apical foramen significantly
(D) Avoiding irrigation to prevent damage

127. A tooth with extensive decay and a necrotic pulp is scheduled for root canal therapy. The crown structure is severely compromised. What is the recommended management prior to obturation?
(A) Place a post and core after obturation
(B) Perform extraction immediately
(C) Build up the tooth with a suitable restorative material (core buildup) for proper isolation
(D) Omit rubber dam isolation due to minimal tooth structure

128. In a single-visit root canal therapy protocol, which step would be incorrect?
(A) Thorough canal cleaning and shaping

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(B) Obturation if the canal is dry and asymptomatic
(C) Immediate final restoration if there's no sign of infection
(D) Leaving necrotic debris in the canal for a second appointment

129. Excessive instrumentation beyond the apical foramen often leads to:
(A) Reduced postoperative pain
(B) Better sealing of the apex
(C) Potential extrusion of debris and irritants
(D) A thicker root canal wall

130. Which red flag during root canal therapy might suggest a vertical root fracture is present rather than a simple post-operative sensitivity?
(A) Generalized slight tenderness to percussion
(B) Radiographic evidence of a J-shaped or halo-like lesion around the root
(C) Mild transient pain resolving with analgesics
(D) Discomfort only on biting after a recent filling

131. Assertion: Warm obturation techniques often provide improved adaptation of gutta-percha to canal walls.
Reason: Heating gutta-percha makes it more brittle and less flowable.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

132. Which sealer type is popular for its bioceramic properties and high pH?
(A) Zinc oxide eugenol-based sealer
(B) Glass ionomer-based sealer
(C) Epoxy resin-based sealer
(D) Calcium silicate-based sealer

133. Why is it essential to remove the smear layer before final obturation?
(A) Smear layer helps bond gutta-percha to dentin
(B) Smear layer can block sealer penetration into dentinal tubules
(C) Smear layer is entirely beneficial and should be retained
(D) Smear layer increases dentin permeability for better sealing

134. A 40-year-old patient presents with persistent pain months after root canal treatment on the lower first molar. Radiographs reveal a radiolucency around the mesial root apex, and clinical notes show no mention of separate mesial canals. On re-treatment, the endodontist locates an untreated second mesial canal. This scenario exemplifies which principle of endodontic failure?
(A) Obturation with warm vertical technique always fails
(B) Missed canal leading to persistent infection
(C) Post-operative restoration is unnecessary
(D) Excessive coronal tooth structure

135. After root canal therapy, a patient returns with diffuse pain and swelling localized around the treated tooth. Which diagnostic sign most strongly indicates a failed RCT due to persistent infection?
(A) Patient's mild sensitivity to hot liquids
(B) A large periapical radiolucency that increased since treatment
(C) Slight discoloration of the crown
(D) Normal sinus tract drainage with no radiographic changes

136. In endodontic retreatment, how does the approach differ from initial root canal therapy?
(A) Retreatment omits the cleaning step, focusing only on obturation
(B) Retreatment often requires removal of previous filling and any obstructions
(C) Retreatment never uses irrigants for fear of damaging existing sealers
(D) Retreatment is always done surgically, not non-surgically

137. For a tooth with persistent periapical lesion after RCT, non-surgical retreatment is usually the first choice unless:
(A) The patient prefers extraction of all endodontically treated teeth
(B) There is a significant coronal obstruction or failing restoration that can't be removed
(C) The canal filling appears homogeneously condensed
(D) A mild post-obturation sensitivity is present

138. During endodontic retreatment, a separated file fragment is discovered in the apical third. The canal is infected. Which approach is most appropriate?
(A) Attempt to bypass or remove the fragment for proper cleaning
(B) Seal the canal coronal to the fragment and ignore the apical section
(C) Immediately place a post and core
(D) Proceed with routine finishing and fill the canal

139. A key action to ensure gutta-percha adaptation in lateral condensation is:
(A) Using a heated plugger to warm the master cone
(B) Applying a finger spreader or hand spreader incrementally
(C) Overfilling the canal by 3–4 mm
(D) Substituting sealer with vaseline for lubrication

140. After completing root canal instrumentation, the canal exhibits persistent weeping exudate at the apex. What is the best next step before obturation?
(A) Immediately fill with gutta-percha
(B) Dry with paper points and place an intracanal medicament
(C) Increase file size beyond the apex
(D) Leave the tooth open to drain indefinitely

141. Which action is incorrect when attempting to maintain patency of a root canal?
(A) Using a small file (e.g., #10 or #15) to gently reach the working length regularly
(B) Irrigating frequently to remove debris
(C) Forcing large files beyond the apex
(D) Establishing working length with electronic apex locator and radiographs

142. Insufficient final irrigation or incomplete removal of smear layer can lead to:
(A) Enhanced bond of sealer to dentin
(B) Microbial retention in canal irregularities
(C) Immediate apex closure
(D) An overextended master cone

143. During a routine follow-up, a tooth that received RCT six months ago remains tender to percussion. Which red flag might suggest a lateral canal or missed canal infection?
(A) Normal radiograph with no lesions
(B) Patient's mild soreness only upon biting very hard
(C) A small, isolated radiolucency on the lateral aspect of the root
(D) No symptoms, but slight discoloration of the crown

144. Assertion: Gutta-percha is the primary filling material in root canal therapy.
Reason: Gutta-percha alone forms an impervious seal without any sealer.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

145. Which investigation helps detect canal curvature and potential extra canals before endodontic treatment?
(A) Electrical pulp tester
(B) Percussion test
(C) Cone-beam computed tomography (CBCT)
(D) Rubber dam isolation

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146. A 50-year-old patient with persistent draining sinus tract on a previously endodontically treated molar undergoes re-treatment. During instrumentation, the dentist notes a fourth canal previously missed. What key step ensures complete re-disinfection?
(A) Removing old gutta-percha and irrigating the newly found canal thoroughly
(B) Placing a direct composite without cleaning
(C) Only testing the occlusion
(D) Sealing the new canal with no instrumentation

147. A patient's maxillary first molar was obturated six months ago. They now complain of mild pain on biting. Radiographically, the MB2 canal appears unfilled. The dentist contemplates a non-surgical re-treatment. Which measure is critical for locating and accessing the MB2 canal during re-treatment?
(A) Immediate post placement
(B) Use of ultrasonic troughing under magnification
(C) Relying solely on a standard round bur without visualization aids
(D) Scheduling an apicoectomy without re-treatment

148. A 35-year-old patient presents with chronic periapical abscess on a previously root-canal-treated premolar. Radiographs show an insufficient fill short of the apex, with lateral voids. The dentist plans non-surgical retreatment. Which step is crucial for removing the old gutta-percha?
(A) Heat application and solvents
(B) High-speed diamond bur
(C) Direct compression with a hand spreader
(D) Chloroform injection into the apex

149. A 42-year-old patient returns with a swollen face and moderate pain related to a mandibular second molar endodontically treated three years ago. Radiographs reveal a periapical radiolucency around the distal root. Clinical testing shows mild mobility, and the crown is intact. After removing the old filling, the dentist locates an isthmus connecting two distal canals. The canals appear partially obturated and show necrotic debris. What fundamental step in non-surgical retreatment is most vital to resolve this recurrent infection?
(A) Merely packing new gutta-percha
(B) Detailed debridement and disinfection of the entire isthmus and canals
(C) Immediate extraction and implant
(D) Doing nothing and observing

150. After thorough debridement in re-treatment, the dentist places a calcium hydroxide dressing due to persistent drainage. On a subsequent visit, drainage subsides, and the canal is dry. The next management step is to:
(A) Perform apexification with MTA
(B) Obtain final working length and obturate with gutta-percha and sealer
(C) Leave calcium hydroxide in place for several more months
(D) Immediately extract the tooth

151. What is the central rationale behind minimally invasive cavity preparation in modern operative dentistry?
(A) Creating large undercuts for retention
(B) Maximally extending the outline form
(C) Preserving healthy tooth structure while removing only irreversibly damaged tissue
(D) Eliminating the need for isolation during restoration

152. Which statement best describes the role of a dental hatchet in cavity preparation?
(A) It is used to remove metallic restorations
(B) It refines internal walls and creates sharp line angles
(C) It is primarily for polishing composite restorations
(D) It is used only in endodontic procedures

153. Why is it recommended to create a flat pulpal floor in a Class I amalgam preparation?
(A) To provide a reservoir for composite bonding agents

(B) To reduce stress concentration and improve resistance
(C) To mimic the natural cusp inclines
(D) To allow infiltration of moisture to the pulp

154. All of the following are objectives of properly contoured matrix band placement in a Class II composite restoration except:
(A) Re-establishing natural proximal contours
(B) Preventing excess restorative material at the gingival margin
(C) Enhancing mechanical retention within the box
(D) Facilitating a tight contact with the adjacent tooth

155. When comparing a tooth prepared for an inlay versus a full coverage crown, which statement is correct?
(A) Inlay preparations require more extensive tooth reduction
(B) Full crown preparations conserve more tooth structure
(C) Inlay preparations are more conservative, retaining more healthy structure
(D) Both require identical axial and occlusal reductions

156. A dentist notices the preoperative diagnosis suggests "affected dentin" remains in a deep cavity close to the pulp. What is the best approach for management under a new restoration?
(A) Remove all stained dentin aggressively
(B) Place a liner or base over the affected dentin if it is hard and seal it
(C) Perform full pulpectomy in every deep lesion
(D) Leave the cavity open for self-cleansing

157. Which factor is most crucial in deciding between a Class II amalgam versus composite restoration in a posterior tooth?
(A) Patient's preference alone
(B) Presence of moisture or ability to isolate for bonding
(C) The color shade of the final filling
(D) Whether the dentist is left-handed or right-handed

158. A patient complains of brief cold sensitivity in a newly placed Class I composite. Which sign suggests the restoration is otherwise successful and sensitivity is transient?
(A) High occlusal contact with pain on biting
(B) Radiolucency under the restoration
(C) Sensitivity that diminishes within seconds and no lingering pain
(D) Persistent throbbing pain for hours

159. According to recommended guidelines, which step is essential before placing a final restoration in a tooth that underwent indirect pulp capping?
(A) Removing the recently placed liner to inspect the pulp
(B) Ensuring the tooth is asymptomatic and verifying no secondary caries
(C) Keeping the tooth unrestored for 12 months
(D) Immediately cementing a full crown without re-evaluation

160. In a pediatric patient's permanent first molar with a deep caries lesion and signs of reversible pulpitis, the best management to maintain vitality is:
(A) Complete pulpectomy and root canal treatment
(B) Placement of a full-coverage stainless steel crown without pulp therapy
(C) Pulpotomy or partial caries removal with a biocompatible liner
(D) Extraction to prevent future problems

161. Which action is incorrect during a composite incremental layering technique?
(A) Placing composite in 2 mm increments
(B) Light-curing each layer thoroughly
(C) Extending each layer onto multiple cavity walls at once to reduce time
(D) Using a wedge to stabilize the matrix system for Class II

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162. Insufficient finishing or poor contouring of a Class II amalgam or composite restoration can lead to:
(A) Improved gingival health
(B) A perfectly sealed proximal contact
(C) Food impaction and plaque retention near the contact area
(D) Reduced occlusal wear

163. A Class I composite is placed in a lower first molar. After a few days, the patient complains of sharp pain on biting localized to that tooth. Which red flag suggests an occlusal high spot rather than pulpitis?
(A) Persistent throbbing pain unrelated to biting pressure
(B) Pain that lingers for minutes after cold test
(C) Pain only when the opposing tooth contacts the restoration
(D) Pain accompanied by fever and facial swelling

164. Assertion: In indirect pulp capping, affected dentin is sometimes retained beneath a liner.
Reason: Affected dentin can remineralize if bacterial access is sealed off.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is false, but Reason is true.
(D) Assertion is true, but Reason is false.

165. What is the primary goal of pulpotomy in a young permanent tooth with open apex?
(A) Eliminating the radicular pulp entirely
(B) Maintaining radicular pulp vitality to continue root development
(C) Creating an apical barrier with MTA immediately
(D) Reducing crown height for a future prosthesis

166. Which material is commonly used for direct pulp capping and has known high biocompatibility?
(A) Polycarboxylate cement
(B) Mineral trioxide aggregate (MTA)
(C) Silicate cement
(D) Zinc phosphate cement

167. Why might a pulpectomy be indicated over a pulpotomy in a permanent tooth with a history of lingering thermal pain and deep caries?
(A) Because lingering thermal pain suggests irreversible pulpitis
(B) To leave coronal pulp for bridging dentin formation
(C) To reduce reliance on any sealer or obturation material
(D) Because the best practice is always pulpectomy in every deep cavity

168. All of the following are goals of apexification except:
(A) Inducing a calcified barrier in a necrotic tooth with open apex
(B) Promoting thickening of dentinal walls and continued root growth
(C) Creating conditions for final obturation without overextension
(D) Sealing the root canal system to prevent reinfection

169. How does apexification differ from revascularization in an immature necrotic tooth?
(A) Both aim to continue natural root development
(B) Apexification typically involves placing calcium hydroxide or MTA to form a barrier, whereas revascularization attempts to revitalize pulp
(C) Revascularization requires removing all coronal tooth structure
(D) Apexification ensures thickening of dentin in the root walls

170. During a pulpotomy on a young permanent molar, the dentist observes healthy radicular pulp stump with minimal bleeding that stops quickly. Which medicament best facilitates healing and a successful outcome?
(A) Ferric sulfate or MTA on the radicular pulp
(B) Amalgam filling directly over the pulp stump
(C) Composite resin with no liner
(D) Direct gold foil over the pulp

171. A 9-year-old with a cariously exposed vital pulp in a first permanent molar. Radiographs reveal open apices and no periapical pathology. Which procedure is most appropriate?
(A) Conventional root canal therapy
(B) Extraction and space maintainer
(C) Pulpotomy with MTA or similar agent
(D) Full coverage crown without pulp therapy

172. A patient complains of a dull ache in a tooth recently treated with a glass ionomer restoration. Which symptom suggests the pain might originate from incomplete removal of caries rather than just normal post-op response?
(A) Sharp, momentary pain with cold testing that resolves instantly
(B) Intermittent mild pressure sensitivity with no other issues
(C) Progressive, increasing discomfort even at rest
(D) No sensitivity unless biting on very hard foods

173. Which protocol is recommended to minimize microleakage when placing an amalgam restoration in a deep cavity?
(A) Immediate final polishing
(B) Use of a bonding agent or cavity varnish
(C) Omission of any liner or base
(D) Placing the amalgam in one large increment

174. A large Class I composite restoration is placed in a molar with minimal occlusal clearance. Postoperatively, the patient complains of biting pain. Which initial management step is recommended?
(A) Check and adjust occlusion with articulating paper
(B) Extract the tooth immediately
(C) Place a stainless steel crown
(D) Reopen the cavity and re-bond the composite

175. Which step is incorrect when bonding a composite restoration in a Class V abrasion lesion?
(A) Isolating the area thoroughly
(B) Slightly roughening the surface with a bur
(C) Desiccating the dentin completely prior to primer
(D) Using an appropriate adhesive system

176. Recurrent caries at the margin of a restoration often results from:
(A) Perfect adaptation and seal
(B) Thermal insulation from a thick liner
(C) Microleakage and bacterial invasion
(D) High occlusion relieving functional stress

177. After a root canal in a lower molar, the dentist places a large composite buildup for final restoration. The patient returns weeks later complaining of dull pain and swelling near the gingiva. Which red flag might indicate an overhanging margin causing soft tissue irritation rather than endodontic failure?
(A) Pus discharge from the apex area
(B) Percussion sensitivity localized to the root apex
(C) Palpable subgingival overextension of the restoration margin
(D) Radiolucency near the apex on a follow-up radiograph

178. Assertion: In revascularization procedures for immature necrotic teeth, minimal mechanical instrumentation is recommended.
Reason: Excessive canal instrumentation can remove the vital tissue needed to form an apical barrier.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

179. Which phrase best defines an onlay restoration?
(A) A direct filling placed in a single visit
(B) An indirect restoration covering at least one cusp
(C) A type of full crown with circumferential coverage
(D) A short-term temporary restoration

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180. Which step is essential before cementation of a ceramic onlay to ensure optimal bonding?
(A) Applying a thin coat of eugenol-based temporary cement
(B) Using a diamond bur on the occlusal surface of the onlay
(C) Etching the internal ceramic surface with hydrofluoric acid and applying silane
(D) Storing the onlay in water for 48 hours

181. Why might a glass ionomer restoration be favored for a Class V cervical area in an older patient with root surface exposure and high caries risk?
(A) It provides no fluoride release
(B) It lacks chemical adhesion to dentin
(C) It tolerates moisture better and releases fluoride
(D) It requires strictly perfect isolation like composite

182. All of the following are considered advantages of using a rubber dam in operative and endodontic procedures except:
(A) Improved access and visibility
(B) Reduced contamination by saliva and oral fluids
(C) Comprehensive mechanical retention of the restoration
(D) Safety from aspiration or ingestion of instruments

183. When comparing zinc oxide eugenol (ZOE) bases to resin-modified glass ionomer (RMGI) bases, which statement is correct?
(A) ZOE is fully compatible with resin-based composites
(B) RMGI offers fluoride release and better bonding than ZOE
(C) RMGI has no advantage in moisture tolerance
(D) ZOE is typically used under composite to enhance adhesion

184. A new endodontic resident is reviewing techniques for obturation. They want a method providing dense, homogeneous filling in a curved canal. Which technique is most suitable?
(A) Cold lateral condensation
(B) Single gutta-percha cone technique
(C) Warm vertical condensation (continuous wave)
(D) Silver point obturation

185. When using nickel-titanium rotary instruments, one key action to prevent file separation is:
(A) Applying maximum apical force
(B) Using high rotational speeds without lubrication
(C) Monitoring torque and replacing files showing fatigue
(D) Bypassing the apex by 2–3 mm

186. A patient with a recently placed composite buildup over a root-canal-treated tooth returns complaining of tenderness when biting. Radiographs show no periapical pathology, but occlusion looks slightly high. What is the best immediate step?
(A) Dismiss it as normal healing
(B) Adjust the occlusion and check for elimination of symptoms
(C) Schedule surgical exploration
(D) Prescribe systemic antibiotics

187. In a conventional multi-visit root canal therapy, which step is incorrect?
(A) Access cavity preparation and working length determination
(B) Thorough cleaning and shaping of the canals
(C) Leaving the tooth permanently open until the next appointment
(D) Placing calcium hydroxide as an intracanal medicament

188. Aggressive flaring of root canals with large-diameter burs can lead to:
(A) Better preservation of radicular dentin
(B) A reduced risk of root fracture
(C) Thinning of canal walls and predisposition to vertical root fracture
(D) Improved vitality of the radicular pulp

189. A patient returns six months after a pulpotomy on a permanent tooth complaining of occasional tenderness. Radiographs show a developing periapical radiolucency. Which red flag suggests the radicular pulp is necrotic rather than still vital?
(A) Sensitivity to cold testing in the radicular pulp
(B) Radiographic signs of continued root development
(C) Absence of spontaneous pain
(D) A progressively enlarging periapical lesion

190. Assertion: Composite restorations can be placed incrementally to reduce polymerization shrinkage. Reason: Large bulk fills allow complete light penetration in deep preparations.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

191. A tooth with suspected missed canal is best evaluated with:
(A) An apex locator
(B) Conventional single periapical radiograph from one angle
(C) Bitewing radiograph
(D) Cone-beam computed tomography (CBCT)

192. A 35-year-old patient's Class II MO amalgam shows a radiographic overhang. The patient complains of food impaction. What is the immediate step to alleviate this issue?
(A) Replace the restoration entirely
(B) Polish and remove the overhang if feasible
(C) Prescribe antibiotics to reduce inflammation
(D) Perform root canal treatment

193. A 12-year-old presents with a deep occlusal caries in a partially erupted molar. Radiographs reveal the pulp is vital and the roots are still forming. Upon accessing, there is a small pulp exposure with healthy bleeding. Which vital pulp therapy option most suitably preserves root development?
(A) Direct pulp capping with MTA
(B) Full pulpectomy
(C) Immediate pulpotomy with MTA
(D) Extraction for orthodontic reasons

194. A 17-year-old's maxillary central incisor has an open apex and necrotic pulp following trauma. Radiographic evaluation confirms periapical radiolucency. The dentist decides on a regenerative endodontic procedure rather than apexification. Which primary goal differentiates regeneration from traditional apexification?
(A) Creating a calcific barrier at the apex
(B) Promoting thickening of dentinal walls and continued root elongation
(C) Immediate obturation with gutta-percha
(D) Sealing the canal coronal to the open apex

195. A 56-year-old patient with extensive cervical lesions on multiple premolars and high caries risk is referred for operative management. The lesions encroach upon the root surfaces, complicating isolation. The dentist opts for glass ionomer restorations after removing caries. Within a few weeks, mild sensitivity resolves, and gingival tissues appear healthier. Why is glass ionomer a suitable choice under these challenging conditions?
(A) It demands a perfectly dry field
(B) It releases fluoride and tolerates slight moisture
(C) It prohibits chemical bonding to dentin
(D) It lacks any anticariogenic property

196. A dentist finds an asymptomatic necrotic pulp with a chronic apical abscess in a mandibular molar with relatively straight canals. Which approach is typically favored first?
(A) Non-surgical root canal treatment
(B) Apicoectomy and retrograde filling
(C) Extraction and implant placement
(D) Decorative inlay without endodontic treatment

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197. Assertion: High-copper dental amalgams exhibit reduced marginal breakdown.
Reason: Excess copper in the alloy reacts with tin, minimizing the weak gamma-2 phase.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is false, but Reason is true.
(D) Assertion is true, but Reason is false.

198. Which resin sealer type is known for excellent flow and long working time but can have some polymerization shrinkage?
(A) Zinc oxide eugenol-based
(B) Glass ionomer-based
(C) Epoxy resin-based (e.g., AH Plus)
(D) Silicone-based

199. Why is the smear layer generally removed in endodontic procedures before final obturation?
(A) To accelerate drying of the canal
(B) To create undercuts for gutta-percha
(C) To expose dentinal tubules and improve sealer penetration
(D) To ensure the canal walls remain contaminated

200. All of the following factors improve the prognosis of a root canal–treated tooth except:
(A) Adequate coronal seal to prevent reinfection
(B) Meticulous canal debridement and obturation
(C) Continued microleakage at the restoration margins
(D) Appropriate post space preparation without weakening root

CHAPTER 08

ORTHODONTICS

1. Which of the following terms accurately describes the initial formation of the craniofacial region during prenatal development?
   (A) Osteogenic modeling
   (B) Embryonic morphogenesis
   (C) Dermal proliferation
   (D) Chondral migration

2. During which prenatal period do the branchial (pharyngeal) arches begin to significantly contribute to craniofacial structures?
   (A) Fetal period (beginning of 9th week)
   (B) Embryonic period (3rd to 8th week)
   (C) Perinatal period (around birth)
   (D) Neonatal period (first 4 weeks after birth)

3. How does the neural crest contribute to craniofacial growth in the prenatal stage?
   (A) It forms only the tongue muscles
   (B) It provides progenitor cells for cartilage, bone, and connective tissues
   (C) It acts solely as a signaling pathway without tissue contribution
   (D) It replaces the mesoderm entirely in the craniofacial region

4. All of the following are key factors influencing prenatal craniofacial development EXCEPT:
   (A) Genetic signaling pathways
   (B) Nutritional deficiencies
   (C) Infectious teratogens
   (D) Environmental gravity changes

5. Which pair of structures best illustrates the difference between intramembranous and endochondral ossification in craniofacial growth?
   (A) Mandible (intramembranous) vs. maxilla (endochondral)
   (B) Maxilla (intramembranous) vs. ethmoid bone (endochondral)
   (C) Zygomatic bone (endochondral) vs. sphenoid bone (intramembranous)
   (D) Occipital bone (intramembranous) vs. nasal cartilage (endochondral)

6. Which prenatal structure most crucially influences the growth pattern of the midface?
   (A) Meckel's cartilage
   (B) Reichert's cartilage
   (C) Frontonasal prominence
   (D) Palatine processes

7. A pregnant patient is found to have inadequate folic acid intake during the first trimester. Which craniofacial developmental defect is most commonly associated with this deficiency?
   (A) Cleft lip and/or cleft palate
   (B) Overgrowth of the mandible
   (C) Early fusion of cranial sutures
   (D) Hypertrophy of midfacial structures

8. A research study identifies a pregnant population at high risk for craniofacial anomalies. Which immediate measure is most effective in reducing the incidence of such anomalies?
   (A) Administration of tetracycline
   (B) Advising bed rest in the last trimester
   (C) Folic acid supplementation
   (D) Intensive postnatal screening

9. Which is the key developmental action that ensures separation of the oral and nasal cavities during prenatal craniofacial growth?
   (A) Fusion of lateral nasal processes
   (B) Fusion of palatine shelves
   (C) Downward rotation of the septum
   (D) Development of the temporal bone

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10. When describing postnatal craniofacial growth, which of the following statements is INCORRECT?
    (A) The mandible continues to remodel at its condylar region
    (B) The maxilla grows by sutural expansion and alveolar process development
    (C) Nasal cartilage has no role in midfacial growth after birth
    (D) Cranial base synchondroses can influence anteroposterior facial dimensions

11. Which craniofacial structure is most likely to exhibit the earliest growth completion timeline after birth?
    (A) Mandibular ramus height
    (B) Nasomaxillary complex width
    (C) Cranial vault circumference
    (D) Condylar head remodeling

12. Reduced growth at the condylar cartilage postnatally most directly causes which facial characteristic?
    (A) Excessive posterior facial height
    (B) Deficient mandibular length
    (C) Widened zygomatic arches
    (D) Accelerated maxillary transverse expansion

13. A 3-year-old child presents with a history of congenital micrognathia and feeding difficulties due to a small jaw and posteriorly displaced tongue. A genetic test reveals the child has Pierre Robin sequence. Which factor best explains this craniofacial presentation?
    (A) Overgrowth of the maxilla
    (B) Excessive prenatal folic acid
    (C) Intrauterine mandible constraint
    (D) Premature fusion of the cranial vault sutures

14. A neonate is diagnosed with Treacher Collins syndrome. Which craniofacial developmental event is most disrupted in this condition?
    (A) Fusion of the medial nasal and maxillary processes
    (B) Migration of neural crest cells into the first and second branchial arches
    (C) Downward growth of the primary palate
    (D) Expansion of the spheno-occipital synchondrosis

15. A child exhibits restricted mandibular growth due to condylar hypoplasia identified early in life. Which management approach is typically recommended to promote jaw development?
    (A) Surgical resection of the condyle
    (B) Use of functional appliances
    (C) Immediate extraction of primary molars
    (D) Application of fixed orthodontic brackets

16. According to standard pediatric growth monitoring guidelines, how frequently should craniofacial measurements be recorded in early childhood?
    (A) Monthly for the first 5 years
    (B) At key developmental milestones (birth, 6 months, 1 year, annually thereafter)
    (C) Once at birth only
    (D) Every 6 months until 18 years of age

17. Which finding is a red flag in postnatal craniofacial growth that may suggest an underlying syndrome?
    (A) Mild mandibular retrognathia that corrects by age 2
    (B) Noticeable facial asymmetry that worsens after infancy
    (C) Slight anterior open bite in mixed dentition
    (D) Diastema in the upper incisors during early mixed dentition

18. Which key clinical sign suggests a deficiency in maxillary growth during adolescence?
    (A) Forwardly placed midface on profile analysis
    (B) Increased lower facial height and open bite tendency
    (C) Prominent nasal bridge with a flattened midfacial region
    (D) Excessive overjet accompanied by a deep labiomental fold

19. Assertion: Postnatal craniofacial growth is influenced by both genetic factors and environmental influences.
Reason: Functional forces from muscles, habits, and occlusal contacts can modify bone growth and remodeling.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is NOT the correct explanation.
(C) Assertion is true, but Reason is false.
(D) Assertion is false, but Reason is true.

20. If a growing child is demonstrating excessive vertical facial growth, which orthodontic management strategy can help modify this pattern?
(A) Growth inhibitor injections at sutures
(B) High-pull headgear to control vertical maxillary excess
(C) Extraction of primary incisors
(D) Posterior bite blocks to stimulate open bite

21. Which radiographic investigation is most commonly used to evaluate overall craniofacial growth patterns and skeletal relationships?
(A) Bitewing radiograph
(B) Hand-wrist radiograph
(C) Orthopantomogram (OPG)
(D) Lateral cephalogram

22. A 9-year-old child presents with a history of mouth breathing and developing anterior open bite. Which structure's growth might be compromised due to chronic nasal obstruction?
(A) Maxillary alveolar process
(B) Nasal septum
(C) Mandibular body
(D) Temporomandibular joint

23. A 10-year-old with chronic allergic rhinitis shows an elongated facial type, narrow maxillary arch, and constricted nasal passage. Parents report restless sleep and snoring. Which primary developmental mechanism is likely responsible for this presentation?
(A) Impaired alveolar bone growth
(B) Reduced septal cartilage-driven maxillary growth
(C) Overdeveloped mandibular symphysis
(D) Early closure of cranial sutures

24. A 12-year-old patient presents with a two-year history of enlarged tonsils and mouth breathing. Examination shows underdeveloped maxilla and an increased lower facial height. How does chronic mouth breathing interfere with normal maxillary growth mechanisms?
(A) It displaces the zygomatic arch forward
(B) It lowers the tongue posture, decreasing palatal growth
(C) It restricts the septal cartilage's full development
(D) It expedites closure of maxillary sutures

25. An 11-year-old with chronic nasal polyps has resorted to habitual mouth breathing for at least three years. On clinical evaluation, the child displays a high-arched palate, unilateral posterior crossbite, and an increased anterior facial height. Both parents note that the child snores constantly at night and appears lethargic in the morning. Which primary structure's growth disruption is most responsible for this maxillary deficiency?
(A) Palatine processes
(B) Zygomatic bone
(C) Nasal septum
(D) Frontal bone

26. How is "normal occlusion" classically defined in orthodontics?
(A) Any bite where molars are in end-to-end contact
(B) A balanced relationship with the mesiobuccal cusp of the upper first molar in the buccal groove of the lower first molar
(C) Complete overlap of lower teeth by upper teeth
(D) Presence of less than 2 mm overjet and overbite

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27. Which of the following is NOT a key factor in achieving normal occlusion?
(A) Proper eruption sequence
(B) Balanced muscular forces
(C) Synchronization with jaw growth patterns
(D) Early extraction of primary canines

28. Angle's Class I occlusion means:
(A) Upper incisors are ahead of lower incisors by 5 mm or more
(B) The mesiobuccal cusp of the upper first molar aligns with the mesiobuccal groove of the lower first molar
(C) Lower first molar is distally positioned relative to the upper first molar
(D) Upper incisors occlude lingually to the lower incisors

29. All of the following are considered common features in Angle's Class II div 1 malocclusion EXCEPT:
(A) Increased overjet
(B) Retroclined upper incisors
(C) Forwardly positioned maxilla or retruded mandible
(D) Often a deep bite tendency

30. Which statement best differentiates Angle's Class III malocclusion from Class I?
(A) Class III features a more distal mandibular first molar relationship
(B) Class III often exhibits a reverse overjet or underbite
(C) Class III necessarily involves a prognathic maxilla
(D) Class III cannot coexist with any skeletal discrepancies

31. A patient's molar relationship is Angle's Class I, but they have mild crowding in the anterior region. Which treatment approach is typically best for this mild malocclusion?
(A) Surgical mandibular setback
(B) Orthognathic maxillary advancement
(C) Orthodontic alignment with possible minor stripping or expansion
(D) Extraction of all four premolars

32. Which scenario best describes a patient requiring interceptive orthodontics for malocclusion prevention?
(A) A 16-year-old with fully erupted permanent dentition needing anterior alignment
(B) An 8-year-old with early mesial shift of molars and mild crowding in the anterior region
(C) A 25-year-old patient seeking aesthetic correction of diastema
(D) A 12-year-old with complete permanent dentition and normal occlusion

33. A 7-year-old is observed to have an anterior crossbite on one newly erupted permanent incisor. Which immediate management is usually recommended to prevent further malocclusion?
(A) Extraction of the opposing tooth
(B) Removable appliance with an anterior bite plane or Z-spring
(C) Observation until all permanent incisors erupt
(D) Mandibular setback orthognathic surgery

34. Which key feature distinguishes interceptive orthodontics from comprehensive orthodontics?
(A) Use of permanent dentition rather than primary dentition
(B) Focus on spotting and correcting developing problems early
(C) Mandatory extraction of four premolars
(D) Reliance solely on fixed appliances

35. In the process of diagnosing a child for interceptive orthodontic treatment, which step is INCORRECT?
(A) Performing a clinical examination of oral habits like thumb sucking
(B) Taking radiographs to assess developing permanent teeth
(C) Extracting fully healthy primary teeth without justification
(D) Evaluating occlusal relationships in centric and eccentric positions

36. Which interceptive measure is most likely to be used in a child with a persistent digit-sucking habit leading to an anterior open bite?
(A) High-pull headgear
(B) Removable Hawley retainer
(C) Thumb crib or habit breaker appliance
(D) Serial extraction

37. An untreated mouth-breathing habit in childhood can lead to which key occlusal issue?
(A) Excessive horizontal overlap (large overjet)
(B) Posterior open bite
(C) Unilateral crossbite of only the posterior teeth
(D) Long-face syndrome with narrow maxillary arch

38. A 9-year-old girl has a habit of resting her lower lip between her upper and lower incisors. Dental records show increasing proclination of the upper incisors. Which interceptive measure would most effectively address this lip trap habit?
(A) Orthognathic surgery to advance the mandible
(B) Lip bumper device
(C) Expansion appliance on the maxilla
(D) Use of a removable functional appliance

39. An 8-year-old presents with premature loss of primary second molars. Radiographs confirm the permanent premolars have not yet erupted. Which interceptive device is most suitable to maintain space for these unerupted premolars?
(A) Lingual holding arch
(B) Transpalatal arch with acrylic button
(C) Band and loop space maintainer
(D) Nance appliance

40. A 7-year-old child with a missing primary first molar is at high risk for space loss. Which management is usually advised?
(A) Immediate partial denture
(B) Bilateral Nance appliance
(C) No intervention is needed unless crowding appears
(D) Placement of a unilateral space maintainer

41. According to standard guidelines for pediatric dental care, when should a space maintainer be removed?
(A) Once the permanent tooth bud is visible radiographically
(B) Immediately after placement if the child feels discomfort
(C) Only after the erupting permanent tooth breaks the gum surface
(D) Whenever the child reaches 10 years of age

42. If a child with multiple primary tooth losses shows a severe arch length discrepancy, which hidden condition must be ruled out?
(A) Juvenile hypothyroidism
(B) Congenital absence of permanent tooth buds
(C) Temporomandibular joint ankylosis
(D) Early closure of the mid-palatal suture

43. A child requiring space maintenance frequently complains that the appliance is impinging on the gingiva. What key sign would confirm that the device needs adjustment?
(A) Mild tooth mobility around anchor teeth
(B) Gingival inflammation or ulceration beneath the appliance
(C) Slight difficulty in chewing
(D) Occasional drooling during speech

44. Assertion: Space maintainers should be checked periodically for fit.
Reason: Jaw growth and tooth eruption can alter the relationship between the maintainer and the teeth or gingiva.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is not the correct explanation.
(C) Assertion is true, Reason is false.
(D) Assertion is false, Reason is true.

45. A 9-year-old has an anterior open bite due to a prolonged tongue thrust habit. Which interceptive measure is typically recommended?
(A) Tongue crib or tongue guard
(B) Fixed orthodontic braces

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(C) Extraction of the lower incisors
(D) No intervention, it will self-correct

46. Which radiographic view is most appropriate to confirm the presence and position of unerupted maxillary canines in a child requiring interceptive treatment?
(A) Occlusal radiograph
(B) Periapical radiograph
(C) Orthopantomogram (OPG) plus Anterior Occlusal View if needed
(D) Lateral cephalogram

47. A 10-year-old presents with a thumb-sucking habit, leading to proclined upper incisors and spacing. Parents ask about interceptive options. Which device specifically targets discouraging thumb entry?
(A) Bluegrass appliance
(B) Hawley retainer
(C) Class II elastics
(D) Chin cup

48. An 8-year-old with a retained primary upper incisor has an erupting permanent incisor deflected palatally. Examination suggests the primary tooth is ankylosed. Which interceptive approach is indicated?
(A) Space regainer appliance
(B) Delayed extraction to observe spontaneous shedding
(C) Extraction of the ankylosed primary tooth and guidance of eruption
(D) Surgical exposure of the permanent incisor

49. A 9-year-old child has an anterior crossbite involving two permanent incisors. The dentist proposes a removable appliance with an inclined plane to tip the incisors forward. Which interceptive principle is applied here?
(A) Growth redirection
(B) Dental arch expansion
(C) Functional re-education
(D) Simple tooth movement

50. A 10-year-old presents with a developing Class III dental relationship seen only in the incisor region, while the molar relationship remains Class I. The child exhibits no skeletal anterior crossbite, and growth patterns appear normal. The dentist recommends an interceptive removable appliance with acrylic coverage over the lower incisors to encourage forward positioning of the uppers. What aspect of malocclusion correction is this strategy targeting?
(A) Skeletal jaw realignment
(B) Dental compensation for incisor position
(C) Sutural expansion of the maxilla
(D) Condylar growth stimulation

51. What is the term for an occlusal situation where anterior teeth occlude but there is no vertical overlap?
(A) Anterior crossbite
(B) Edge-to-edge bite
(C) Reverse overjet
(D) Posterior open bite

52. Which classification system is primarily used for anteroposterior jaw relationships in orthodontics?
(A) Dewey's classification
(B) Angle's classification
(C) Martin Dewey analysis
(D) Ackerman-Proffit classification

53. Which component of malocclusion classification focuses on vertical overlap of incisors?
(A) Overjet
(B) Overbite
(C) Crowding
(D) Bolton discrepancy

54. All of the following are commonly seen clinical signs in a deep bite malocclusion EXCEPT:
(A) Excessive incisal display
(B) Trauma to palatal gingiva by lower incisors
(C) Vertical overlap beyond normal range
(D) Significantly reduced lower facial height

55. Which feature distinguishes a skeletal Class II from a purely dental Class II malocclusion?
(A) Lower anterior teeth are positioned behind normal contact points
(B) Upper incisors are proclined
(C) Mandible itself is retrusive relative to the cranial base
(D) Mesiobuccal cusp of upper first molar aligns with mesiobuccal groove of lower first molar

56. Which primary factor should determine whether a Class II malocclusion is treated with orthopedic jaw correction or just dental camouflage?
(A) Severity of crowding
(B) Growth potential of the patient
(C) Patient's facial esthetics preferences
(D) Presence of an anterior open bite

57. A 9-year-old patient shows developing Class III incisor relationship, but cephalometrics confirm normal jaw bases. Which is an effective interceptive strategy to correct the incisor relationship?
(A) Reverse-pull headgear
(B) Chin cup
(C) An inclined plane or removable acrylic appliance
(D) Fixed maxillary expansion device

58. A 12-year-old with partially erupted permanent canines and 3 mm of mandibular arch crowding is experiencing anterior tooth irregularity. Which interceptive step is typically considered first?
(A) Extraction of all first premolars
(B) Stripping (interproximal reduction) of primary canines
(C) Placement of a lingual holding arch
(D) Comprehensive orthodontic fixed appliances

59. Which feature must be evaluated first when planning interceptive orthodontics for a child with crowding?
(A) Early mixed dentition eruption timing
(B) Overbite severity
(C) Patient's facial esthetics
(D) Tongue posture during rest

60. In the interceptive orthodontic workflow for a child, which step is INCORRECT?
(A) Comprehensive history and clinical exam
(B) Immediate extraction of permanent incisors if minor anterior crowding is found
(C) Radiographic review of tooth development
(D) Regular monitoring of growth and dental changes

61. A child with persistent thumb sucking until age 9 is most likely to develop:
(A) Posterior crossbite with normal overjet
(B) Bimaxillary protrusion
(C) Anterior open bite and proclined upper incisors
(D) Skeletal Class III relationship

62. Long-term mouth breathing can cause which occlusal issue primarily due to altered tongue posture?
(A) Narrowed maxillary arch
(B) Distal shift of lower molars
(C) Proclined lower incisors exclusively
(D) Increased posterior occlusal vertical dimension

63. A 10-year-old with chronic nasal obstruction has a habitual mouth-breathing posture. Examination reveals dark circles under the eyes, a pinched nostril appearance, and narrow maxillary arch. The child's dentist recommends evaluation for allergic rhinitis and possible adenoid hypertrophy. What is the rationale behind this referral?
(A) To begin antibiotic therapy
(B) To eliminate the cause of reduced nasal airflow
(C) To confirm congenital bony defects in the palate
(D) To enforce extraction of permanent teeth

64. A 7-year-old child demonstrates a unilateral posterior crossbite due to functional shift. Clinical examination shows no skeletal asymmetry. Which diagnosis is most appropriate?
(A) True unilateral maxillary deficiency
(B) Functional unilateral crossbite

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(C) Bilateral crossbite masked by the shift
(D) Early tongue thrust pattern

65. In a functional unilateral crossbite, what is the preferred interceptive treatment method?
(A) Orthognathic surgery to expand the maxilla
(B) Use of a removable expansion plate or quad-helix
(C) Observation until the patient's permanent dentition is fully erupted
(D) Interproximal stripping of posterior teeth

66. Which guideline is recommended for managing crossbites in the mixed dentition stage?
(A) Immediate correction to prevent asymmetrical growth
(B) Wait until all permanent teeth erupt
(C) Never use expansion in mixed dentition
(D) Extraction of all primary molars involved

67. A child's maxillary incisors have not erupted by age 9, with no extenuating early loss or ankylosis of primary teeth. Radiographs reveal no signs of the permanent incisors. Which red-flag condition must be considered?
(A) Ankylosed primary incisors
(B) Cleidocranial dysplasia
(C) Hypopituitarism
(D) Traumatic intrusion

68. Which key clinical sign suggests a habit-induced malocclusion rather than a skeletal discrepancy?
(A) Bilateral symmetrical maxillary constriction
(B) Reverse overjet with no functional shift
(C) Anterior open bite in the presence of a strong digit-sucking habit
(D) Palpable deficiency at the zygomatic buttress

69. Assertion: Habit-breaker appliances are most effective in children younger than 12 years.
Reason: Skeletal growth modifications become less feasible once the child enters the late mixed or early permanent dentition.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is NOT the correct explanation.
(C) Assertion is true, Reason is false.
(D) Assertion is false, Reason is true.

70. If an 8-year-old's persistent tongue thrust is creating an anterior open bite, which initial management strategy is typically indicated?
(A) Orthognathic surgery
(B) Fixed appliances with brackets and wires
(C) Myofunctional therapy or oral physiotherapy exercises
(D) Extraction of primary incisors

71. Which radiographic view best helps evaluate transverse maxillary discrepancies in a child suspected of needing interceptive expansion?
(A) Lateral cephalogram
(B) Posterior-anterior (PA) cephalogram
(C) Panoramic radiograph
(D) Hand-wrist radiograph

72. A 10-year-old complains of anterior crowding and difficulty with oral hygiene. Examination shows only minor skeletal discrepancy. Which interceptive appliance could expand the arch and reduce crowding?
(A) Twin Block
(B) Frankel III
(C) Hyrax or rapid maxillary expander
(D) Chin cup

73. An 11-year-old is developing bilateral posterior crossbites. Examination reveals deep palatal vault but normal anteroposterior jaw relationship. The dentist recommends a maxillary expansion approach. Which outcome is primarily expected from this interceptive therapy?
(A) Anteroposterior correction
(B) Increased vertical facial growth
(C) Widening of the upper arch to correct crossbites
(D) Rotation of the mandible forward

74. A 9-year-old with a constricted maxilla uses a removable expansion plate for interceptive orthodontics. After 3 months, the crossbite improves, but the child complains of appliance looseness. What is the likely reason?
(A) Appliance breakage
(B) Activation screw malfunction
(C) Successful arch expansion creating a looser fit
(D) Lack of cooperation

75. A 12-year-old girl presents with a mild Class II dental relationship and an associated deep bite. The second primary molars are still present. Cephalometric analysis shows normal skeletal bases with minimal forward positioning of the maxilla. The dentist recommends an upper removable appliance with an anterior bite plane. How might this appliance help her correct the occlusal relationship?
(A) By mandibular surgical repositioning
(B) By restricting vertical eruption of upper anterior teeth
(C) By extracting the second primary molars
(D) By expanding the mid-palatal suture

76. Which general category of appliance is specifically designed to retain or preserve arch space after premature primary tooth loss?
(A) Active expansion appliance
(B) Passive space maintainer
(C) Functional jaw orthopedic device
(D) Lingual arch overlay

77. Which space maintainer is often indicated when a single primary molar is lost prematurely on one side of the lower arch?
(A) Transpalatal arch
(B) Band and loop
(C) Nance palatal arch
(D) Lip bumper

78. Why is the Nance appliance classified as a bilateral space maintainer?
(A) It maintains vertical space in the anterior segment only
(B) It replaces lost canines
(C) It prevents mesial drift of both maxillary first molars
(D) It actively expands the maxillary arch

79. All of the following are space maintainers used in pediatric dentistry EXCEPT:
(A) Band and loop
(B) Distal shoe appliance
(C) Lower lingual holding arch
(D) Lip bumper for anterior bite correction

80. How does a distal shoe space maintainer differ from a band and loop design?
(A) Distal shoe is used when primary anterior teeth are missing
(B) Distal shoe actively moves the permanent molar distally
(C) Distal shoe extends subgingivally to guide an unerupted permanent molar
(D) Distal shoe is exclusively for the maxillary arch

81. A 6-year-old loses a primary second molar early in the lower arch, and the first permanent molar has not erupted yet. Which space maintainer is most appropriate?
(A) Distal shoe appliance
(B) Band and loop
(C) Lingual arch
(D) Nance palatal arch

82. A 9-year-old who prematurely lost both lower primary second molars now shows drifting of permanent first molars mesially. Which appliance can stabilize both sides simultaneously?
(A) Quad-helix
(B) Nance palatal arch
(C) Lower lingual holding arch
(D) Distal shoe

83. A 7-year-old has lost the lower primary first molar prematurely. Radiographs indicate the primary second molar and the first permanent molar are present but not fully erupted. Which space maintainer is typically indicated?
(A) Partial denture
(B) Bilateral Nance appliance

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(C) Band and loop
(D) Soldered lingual arch

84. Which is the key action of a habit breaker for thumb sucking?
(A) To reposition the mandible forward
(B) To interfere with the child's habitual thumb insertion
(C) To expand the palatal suture
(D) To reduce tongue thrust reflex

85. Which is an incorrect guideline when fitting a fixed thumb-sucking habit breaker?
(A) It should have rounded, smooth edges
(B) It must allow normal swallowing and speech
(C) It should forcibly lock the tongue in place
(D) It must be well-tolerated for several months

86. Which outcome is most likely once a habit breaker has successfully eliminated a chronic thumb-sucking habit in a 7-year-old?
(A) Complete spontaneous correction of anterior open bite
(B) Worsening of overjet
(C) Necessity for immediate surgical intervention
(D) Permanent speech impediment

87. A teenager who was not treated for mouth breathing now shows a long-face syndrome. Which primary cause-and-effect mechanism explains this facial pattern?
(A) Chronic lip seal creating upward rotation of the mandible
(B) Reduced nasal airflow leading to lower tongue posture and vertical jaw growth
(C) Early alveolar closure preventing incisal eruption
(D) Excessive anterior facial muscles restricting growth

88. A 9-year-old with incomplete lip seal, habitual mouth breathing, and a forward head posture is diagnosed with adenoid hypertrophy. The dentist prescribes a combination of an oral screen to encourage nasal breathing and ENT evaluation. How does this combined approach help address the root problem?
(A) ENT referral ensures antibiotic coverage; the oral screen is cosmetic
(B) Oral screen fosters normal swallowing while the adenoids remain large
(C) ENT referral addresses airway obstruction; the oral screen helps retrain oral posture
(D) Oral screen cures adenoid hypertrophy

89. A child with mouth breathing habit shows an elongated lower facial height, incompetent lips, and posterior crossbite. Cephalometrics reveal normal skeletal relationships otherwise. Which diagnosis best fits this constellation of signs?
(A) Vertical maxillary excess
(B) Simple mouth breathing syndrome
(C) Hemifacial microsomia
(D) True skeletal Class III

90. A child in the mixed dentition stage with incompetent lips and mouth breathing is at risk for a high mandibular plane angle. Which management step helps minimize further vertical facial growth?
(A) Surgical maxillary impaction
(B) Prescribing nasal decongestants and employing a vestibular shield
(C) Extraction of upper incisors
(D) Immediate orthognathic surgery to the mandible

91. Which statement is TRUE regarding the use of removable appliances in orthodontics?
(A) They can correct severe skeletal discrepancies on their own
(B) They rely heavily on patient compliance for effectiveness
(C) They are strictly for adult orthodontics
(D) They are always more effective than fixed appliances

92. A patient wearing a removable orthodontic appliance presents with chronic irritation and small ulcers on the palate. Which immediate concern must be ruled out?
(A) Improper appliance activation
(B) Allergic reaction to acrylic
(C) Poor tongue posture
(D) Excessive jaw growth

93. Which key sign indicates an overactivated expansion screw in a removable appliance?
(A) Smooth and passive fit of the appliance
(B) Lingual tipping of posterior teeth
(C) Excessive tooth mobility and pain
(D) Reduced buccal corridor space

94. Assertion: Fixed orthodontic appliances provide three-dimensional control of tooth movement.
Reason: Each bracket is designed to deliver specific torque, tip, and in-out positioning forces.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is NOT the correct explanation.
(C) Assertion is true, Reason is false.
(D) Assertion is false, Reason is true.

95. Which basic appliance is used to correct minor rotations in anterior teeth during the mixed dentition, relying on the patient's ability to remove it for cleaning?
(A) Hawley retainer with finger springs
(B) Fixed edgewise appliance
(C) Headgear to the upper molars
(D) Transpalatal arch

96. A dentist wants to assess the alveolar bone height around the roots of teeth before placing a removable appliance. Which radiographic tool is most helpful for evaluating bone levels and root morphology in multiple teeth simultaneously?
(A) Bitewing radiograph
(B) Panoramic radiograph
(C) Occlusal radiograph
(D) Lateral cephalogram

97. A 13-year-old with minimal crowding requests cosmetic tooth alignment. The dentist prescribes a removable appliance with light labial springs. Which critical factor ensures successful movement?
(A) Constant overactivation
(B) Adequate patient compliance in wear
(C) Strict daytime-only usage
(D) Immediate extraction of premolars

98. A 15-year-old has mild spacing in the anterior maxilla. The dentist provides a removable appliance with an acrylic baseplate and finger springs to retract the spaced incisors. The patient is instructed to wear it full-time except during meals. Which key advantage does this removable approach offer?
(A) Rapid expansion of the maxilla
(B) Precise 3D control of each tooth root
(C) Easy hygiene and reduced chairside adjustments
(D) Guaranteed elimination of overjet

99. A 14-year-old wants minor correction of rotated upper canines. There is no skeletal discrepancy or major crowding. The dentist suggests a removable spring aligner. What primary limitation does this solution have compared to a fixed appliance?
(A) Excessive cost
(B) Reduced ability for bodily tooth movement
(C) High risk of iatrogenic root resorption
(D) Inability to correct rotations

100. A 12-year-old is undergoing interceptive orthodontics using a removable bite plate to reduce a deep overbite. After four months, the overbite improves, but the child complains of difficulty speaking clearly. The dentist notices the plate design extends excessively onto the lingual surfaces of anterior teeth. Which is the most appropriate modification?
(A) Remove the entire appliance until permanent dentition
(B) Trim the acrylic to free the tongue space while retaining the bite block
(C) Switch to full fixed edgewise appliances
(D) Add posterior expansion screws

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101. Which term best describes an orthodontic intervention specifically aimed at eliminating a developing dental problem in a growing child to prevent a fully established malocclusion?
(A) Preventive orthodontics
(B) Interceptive orthodontics
(C) Comprehensive orthodontics
(D) Surgical orthodontics

102. Which of the following is an example of a preventive orthodontic procedure?
(A) Extraction of an impacted canine in a 15-year-old
(B) Placement of a band and loop after early loss of a primary molar
(C) Correcting a functional anterior shift using a removable appliance
(D) Mandibular advancement with a functional orthotic device

103. Which principle underlies the use of early functional appliances in orthodontics?
(A) Teeth erupt independently of muscular forces
(B) Jaw growth can be redirected or modified during active growth phases
(C) Skeletal patterns are irreversible after age 8
(D) Environmental factors have negligible influence on jaw development

104. All of the following are indications for serial extraction EXCEPT:
(A) Excessive tooth-size–arch-size discrepancy
(B) Class II skeletal base with deficient mandible
(C) Early crowding in the anterior region
(D) Well-aligned arches except for minimal spacing in incisors

105. Which best distinguishes serial extraction from comprehensive orthodontic treatment?
(A) Serial extraction focuses on rigorous bracket and wire mechanics
(B) Serial extraction attempts to reduce or eliminate the need for complex appliances later
(C) Comprehensive treatment always involves jaw surgery
(D) Comprehensive treatment avoids final alignment of the permanent dentition

106. For a 9-year-old child with 4 mm crowding in the upper arch, normal skeletal bases, and early mixed dentition, which interceptive step is most appropriate?
(A) Immediate four-premolar extraction
(B) Serial extraction plan removing selected primary and possibly premolars
(C) High-pull headgear therapy
(D) Chin cup application

107. A pediatric patient shows diastema in upper incisors due to an oversized labial frenum. Which interceptive approach helps before final orthodontic alignment?
(A) Palatal crib
(B) Frenectomy after permanent canines erupt
(C) Mandibular advancement surgery
(D) Lingual arch space maintainer

108. A 7-year-old with anterior crossbite of a single permanent incisor and no skeletal discrepancy. Which immediate step is typically recommended?
(A) Wait until all permanent incisors erupt
(B) Correct with a removable appliance (Z-spring or inclined plane)
(C) Prescribe a chin cup to reposition the mandible
(D) Extract the lower incisor causing the interference

109. Which key action does a functional appliance like a Twin Block aim to achieve in a growing child with a mild Class II skeletal pattern?
(A) Torque the upper incisors lingually
(B) Promote mandibular forward posturing
(C) Impact the maxillary incisor eruption only
(D) Maintain arch space for unerupted molars

110. When placing a Twin Block appliance, which step is INCORRECT?
(A) Recording an advanced mandibular position in construction bite

(B) Ensuring acrylic blocks do not allow posterior tooth contact at initial insertion
(C) Using gentle anterior acrylic coverage to open the bite
(D) Placing the upper block entirely on the lower arch for crossbite cases

111. In a child with a functional shift producing a unilateral posterior crossbite, which outcome is MOST likely if left untreated?
(A) Full resolution with no intervention
(B) Development of asymmetric mandibular growth
(C) Rapid improvement in midfacial growth
(D) Early exfoliation of permanent teeth

112. Persistent anterior tongue thrust in a growing child can cause:
(A) Lingual tipping of upper incisors
(B) Reduced overjet
(C) Anterior open bite
(D) Progressive horizontal overlap of lower incisors

113. An 8-year-old child with Class I skeletal bases presents with an anterior open bite. History reveals a strong digit-sucking habit. The dentist advises a fixed palatal crib. Which principal effect does this appliance achieve to reduce the open bite?
(A) It inhibits lower jaw growth
(B) It encourages maxillary suture expansion
(C) It physically blocks the thumb from resting between the incisors
(D) It forces the tongue into the upper incisor region

114. A 9-year-old has an anterior crossbite with normal molar relationships and no skeletal discrepancy. The crossbite is limited to one permanent incisor. Diagnosis?
(A) Dental crossbite
(B) Functional shift
(C) Skeletal Class III
(D) Bilateral crossbite

115. A 10-year-old with moderate space deficiency in the maxillary arch is about to lose the primary second molars. The dentist wants to avoid extraction of permanent teeth. Which interceptive approach is recommended?
(A) Palatal expansion using a fixed expander
(B) Extraction of maxillary first premolars
(C) Placement of lower lingual holding arch
(D) Extraction of upper primary incisors

116. Which key symptom might indicate that a child's removable functional appliance is overextended and impacting normal oral function?
(A) Mild pressure on alveolar ridges
(B) Clear speech articulation
(C) Gagging sensation and excessive drooling
(D) Stable occlusal coverage with no discomfort

117. Assertion: Early correction of a single-tooth anterior crossbite can prevent abnormal tooth wear. Reason: The lower incisor in crossbite may traumatize the palatal gingiva if left untreated.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is NOT the correct explanation.
(C) Assertion is true, Reason is false.
(D) Assertion is false, Reason is true.

118. A 7-year-old child exhibits a mild skeletal Class III tendency with forward posturing of the mandible and normal maxillary development. Which functional or orthopedic device could help restrain mandibular growth or redirect it?
(A) Frankel II appliance
(B) Chin cup
(C) Headgear attached to the upper molars
(D) Rapid maxillary expander

119. In evaluating a skeletal Class III case for possible protraction facemask therapy, which key radiographic landmark measurement is often used to quantify maxillary deficiency?
(A) SNA angle
(B) SNB angle

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(C) FMA (Frankfort–mandibular plane angle)
(D) Interincisal angle

120. A 9-year-old with maxillary retrusion uses a protraction facemask. Which associated appliance is often combined to maximize forward movement of the maxilla?
(A) Chin cup
(B) Palatal expander
(C) Fixed edgewise brackets
(D) Tongue crib

121. A 10-year-old with a narrow maxillary arch and anterior crossbite receives a combined rapid maxillary expansion and facemask therapy. After six months, the crossbite resolves, and the child's profile improves. Which underlying principle allows facemask therapy to effectively advance the maxilla in this age group?
(A) Adult-level suture fusion
(B) High condylar remodeling
(C) Patent mid-palatal suture and adaptive sutural growth
(D) Lower incisor extraction

122. An 11-year-old with mild Class III skeletal relationship shows forward mandibular growth. The lower incisors are also proclined. Which single diagnostic criterion best confirms the child's lower jaw is truly prognathic rather than just dentally compensated?
(A) Reduced SNA angle
(B) Increased SNB angle
(C) Large interincisal angle
(D) Low Frankfort–mandibular plane angle

123. A 13-year-old with borderline skeletal Class III and a family history of mandibular overgrowth presents with an edge-to-edge incisor relationship and mild anterior crossbite. Clinical notes reveal a negative overjet increasing over the past year. Cephalometric evaluation shows a near-normal SNA angle, borderline increased SNB angle, and average FMA. Which interceptive/orthopedic approach is recommended to manage mandibular growth?
(A) Facial mask therapy with expansion
(B) Chin cup therapy
(C) High-pull headgear
(D) Surgical mandibular setback

124. In orthodontics, what does the term "Andrews' Six Keys to Normal Occlusion" refer to?
(A) Six guidelines for fabricating removable retainers
(B) Six individualized torque prescriptions for premolars
(C) Six occlusal features that define an ideal Class I occlusion
(D) Six bracket designs introduced by Andrews

125. Which of the following is NOT one of Andrews' Six Keys to Normal Occlusion?
(A) Correct molar relationship
(B) Proper crown angulation
(C) Proper crown inclination
(D) Intentional incisal spacing

126. Which principle underlies the rationale for expansion appliances in interceptive orthodontics?
(A) Suture adaptation and alveolar remodeling can increase arch circumference
(B) Once sutures close, expansion remains equally feasible
(C) Palatal expansion reduces mandibular plane angle
(D) Only soft tissues, not bone, respond to orthodontic forces

127. All of the following are common side effects of rapid maxillary expansion (RME) EXCEPT:
(A) Midline diastema formation
(B) Upward and forward movement of the maxilla
(C) Buccal tipping of posterior teeth
(D) Lower anterior facial height decrease

128. What distinguishes a slow maxillary expansion approach from a rapid maxillary expansion (RME) protocol?
(A) Slow expansion applies larger daily activation
(B) Rapid expansion is used only for adults

(C) Slow expansion may induce more alveolar bending than pure suture separation
(D) Rapid expansion eliminates the need for retention

129. A 10-year-old has a narrow maxilla and moderate crowding. Which method is typically considered the most efficient for skeletal expansion within a short time frame?
(A) Slow expansion with a removable plate
(B) Rapid maxillary expansion using a bonded expander
(C) Interproximal enamel reduction (stripping)
(D) Extraction of primary canines

130. In an 8-year-old, a removable Hawley-type expander is being used for mild transverse deficiency. The parent reports the child is inconsistent in wearing it. Which practical step improves compliance?
(A) Decreasing daily wear to just one hour
(B) Advising nighttime-only wear for immediate correction
(C) Emphasizing at least 14–16 hours of daily wear and scheduling frequent reviews
(D) Switching to a high-pull headgear

131. After successful rapid maxillary expansion in an 11-year-old, which immediate management step is generally advised?
(A) Discontinue the expander and allow immediate relapse
(B) Convert the expander to a holding appliance for retention
(C) Perform bilateral premolar extractions
(D) Instruct the patient to stop visiting the orthodontist for 6 months

132. Which key feature in a removable orthodontic appliance ensures a consistent direction of tooth-moving force?
(A) Acrylic coverage of the occlusal surfaces
(B) Finger springs adjusted to the correct angulation
(C) Hooks for elastics
(D) Bite plane with no screws

133. When delivering a newly fabricated removable expansion plate, which instruction is INCORRECT to give the patient and parents?
(A) Wear the appliance for the recommended daily hours
(B) Activate the expansion screw as directed by the dentist
(C) Remove the appliance during meals for easy cleaning
(D) Stop wearing it at night if mild discomfort is felt

134. Which pediatric patient scenario is MOST likely to benefit from an anterior bite plate?
(A) A child with normal overbite and no deep bite issues
(B) A 10-year-old with severe posterior open bite
(C) An 8-year-old with traumatic deep bite and lower incisors impinging on palatal mucosa
(D) A teenager needing Class III surgical correction

135. An appliance with posterior bite blocks in a child can lead to:
(A) Increased incisal wear
(B) Downward eruption of posterior teeth, closing the bite
(C) Prevention of vertical eruption of posterior teeth, opening the bite
(D) Decreased facial height due to condylar compression

136. A 9-year-old patient has a deep bite with the lower incisors contacting the palatal mucosa. The dentist prescribes a removable anterior bite plane. Two months later, the lower incisors have erupted more, reducing the deep bite. Which effect best explains this improvement?
(A) The bite plane triggers a skeletal forward shift of the maxilla
(B) It encourages lower incisor eruption by discluding the posterior teeth
(C) The incisal edges flatten, creating an open bite
(D) It elongates the condylar neck

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137. A 12-year-old is diagnosed with a pseudo-Class III malocclusion characterized by an anterior posturing of the mandible to achieve incisal contact. Which diagnostic sign confirms it is not a true skeletal Class III?
(A) Normal SNA but increased SNB
(B) Ability to guide the mandible back into an incisal overlap with gentle manipulation
(C) Parental history of mandibular prognathism
(D) Class III molar relationship in centric occlusion

138. For a 10-year-old with pseudo-Class III, the recommended intervention is typically:
(A) Surgical maxillary advancement
(B) Removable appliance to eliminate incisal interference and guide the mandible back
(C) Chin cup therapy
(D) Distalization of lower molars with headgear

139. According to standard interceptive orthodontic guidelines, which scenario justifies an early referral for Class II correction?
(A) A 5-year-old with primary dentition showing mild overjet
(B) An 8-year-old with 10 mm overjet, retrusive mandible, and incompetent lips
(C) A 16-year-old with normal incisor relationship but mild crowding
(D) A 12-year-old with perfect occlusion and slightly rotated incisors

140. Which finding in a 10-year-old suggests a red flag that the malocclusion is syndromic rather than a simple crowding issue?
(A) Minor spacing in upper incisors
(B) A missing third molar on panoramic radiograph
(C) Multiple unerupted permanent teeth with abnormal crown shapes
(D) Early exfoliation of primary teeth around age 6–7

141. A child with a deep bite is wearing a functional appliance. Which key sign suggests improvement?
(A) Worsening of lower incisor eruption
(B) Eruption of posterior teeth decreasing overbite
(C) Thinning alveolar bone around molars
(D) Shift from Class I to Class II incisor relationship

142. Assertion: Removable functional appliances can correct moderate Class II skeletal discrepancies during growth.
Reason: They reposition the mandible forward permanently within weeks of use.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is NOT the correct explanation.
(C) Assertion is true, Reason is false.
(D) Assertion is false, Reason is true.

143. A 12-year-old in the late mixed dentition has bilateral posterior crossbites. The dentist prescribes a quad-helix appliance. Which best describes the quad-helix function?
(A) It applies anterior traction on the maxilla
(B) It is an active removable plate for Class II correction
(C) It is a fixed expander for transverse arch development
(D) It restricts posterior tooth eruption

144. Which radiograph is often used to assess vertical eruption levels of posterior teeth when considering a posterior bite plate?
(A) Lateral cephalogram
(B) Posterior-anterior cephalogram
(C) Panoramic radiograph
(D) Upper standard occlusal view

145. A 10-year-old with inadequate arch length for canines is scheduled for interceptive expansion. Which initial diagnostic step helps confirm that the mid-palatal suture is still patent?
(A) Panoramic radiograph
(B) Hand-wrist radiograph
(C) Posterior-anterior cephalogram
(D) CBCT or maxillary occlusal radiograph

146. A 12-year-old with anterior crowding and unilateral posterior crossbite is advised slow maxillary expansion with a removable plate. After four months, slight improvement in crowding is noted, but the crossbite persists. What likely factor hampered expansion efficacy?
(A) Excessive daily activation force
(B) Poor appliance wear compliance
(C) Over-engineered acrylic coverage
(D) Early removal of appliance after 2 months

147. A 14-year-old with mild Class II malocclusion, partially grown mandible, and stable incisor relationships is recommended a functional appliance (Twin Block). Which factor is most crucial for a successful orthopedic outcome?
(A) Patient's growth potential and compliance
(B) Immediate extraction of second premolars
(C) Use of headgear with every functional appliance
(D) Quick switch to full fixed appliances within 2 weeks

148. A 10-year-old with a Class II, Division 1 malocclusion and incompetent lips is started on a functional appliance. Six months in, there is partial improvement in overjet, but the patient admits to inconsistent wear. The dentist notes that the child is approaching a growth spurt soon. What adjustment optimizes the chances of further improvement before growth peaks?
(A) Discontinue the appliance entirely
(B) Switch immediately to full fixed appliances
(C) Reinforce compliance and refit the functional appliance if necessary
(D) Schedule jaw surgery consultation

149. What is the primary objective of a retention appliance after orthodontic correction?
(A) Achieve further tooth movement
(B) Prevent relapse by maintaining teeth in their corrected positions
(C) Diagnose potential TMJ disorders
(D) Actively widen the dental arches

150. Which type of retainer is typically removable, features a labial bow, and can include acrylic coverage of the palate?
(A) Hawley retainer
(B) Essix retainer
(C) Fixed lingual retainer
(D) Positioner appliance

151. In fixed orthodontics, what is the primary function of a bracket prescription (e.g., Roth or MBT)?
(A) To determine ligature colors
(B) To provide specific tip, torque, and in–out values
(C) To decide whether metal or ceramic brackets are used
(D) To standardize the archwire size

152. Which part of a bracket slots onto the archwire and engages it for tooth movement?
(A) Base mesh
(B) Tie-wing
(C) Slot or channel
(D) Hook extension

153. Why do preadjusted edgewise brackets reduce the need for intricate wire bending during treatment?
(A) They have no built-in torque
(B) They incorporate ideal tip, torque, and rotation in the bracket design
(C) They rely exclusively on rectangular stainless-steel wires
(D) They eliminate the need for all archwire changes

154. All of the following are basic wire materials used in fixed orthodontics EXCEPT:
(A) Nickel-titanium (NiTi)
(B) Stainless steel
(C) Beta-titanium (TMA)
(D) Aluminum-copper alloy

155. Which statement correctly differentiates nickel-titanium (NiTi) wires from stainless steel wires?
(A) NiTi wires are more rigid and less springy than stainless steel

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(B) NiTi wires have shape memory and superelasticity, while stainless steel does not
(C) Stainless steel wires cannot be bent or soldered
(D) Both have exactly the same mechanical properties

156. Which type of orthodontic wire is best suited for the initial leveling and alignment phase in a crowded dentition?
(A) Heavy stainless-steel rectangular wire
(B) Nickel-titanium round wire
(C) Beta-titanium rectangular wire
(D) Solid gold archwire

157. A clinician needs to close extraction spaces in a patient's arch after initial alignment. Which wire characteristic is generally preferred for this space closure phase?
(A) High flexibility and minimal stiffness
(B) Heavy rectangular cross-section for bodily tooth movement
(C) Thin round cross-section that easily deflects
(D) Non-sliding mechanics with coil springs only

158. A patient is in the finishing stage of orthodontic treatment, requiring fine detailing of occlusion. Which type of wire is most commonly used for final detailing adjustments?
(A) Large diameter round stainless-steel wire
(B) Nickel-titanium superelastic wire
(C) Beta-titanium (TMA) rectangular wire
(D) Braided steel archwire

159. What is the key action of a power chain in orthodontic mechanics?
(A) Maintain tooth positions passively
(B) Provide mild anchorage for an arch segment
(C) Deliver continuous elastic traction to close spaces
(D) Prevent undesired rotation of molars

160. When placing power chains during space closure, which step is INCORRECT?
(A) Ensuring minimal plaque around brackets before application
(B) Positioning the chain from one bracket hook to another
(C) Replacing the chain at regular intervals as it loses elasticity
(D) Leaving the chain in place for the entire treatment with no change

161. Which accessory in fixed orthodontics is most likely to be used for intermaxillary traction (Class II or Class III elastics)?
(A) Bracket slot
(B) Elastic separating module
(C) Orthodontic hook or bracket hook
(D) Powerchain

162. A patient with fixed appliances rarely changes the elastics and complains that spacing is not closing. Which cause-and-effect relationship explains this?
(A) Old elastics lose elasticity, reducing consistent force
(B) Elastics spontaneously tighten over time and cause tooth damage
(C) Brackets spontaneously detach when elastics are reused
(D) The archwire breaks if elastics are changed too frequently

163. A 14-year-old with full fixed braces exhibits forward movement of the anchoring molars during space closure, resulting in inadequate anterior retraction. The orthodontist decides to increase anchorage. Which appliance can help reinforce posterior anchorage?
(A) Nance palatal button
(B) Anterior bite plane
(C) Lip bumper
(D) Transpalatal arch with no modifications

164. A patient shows flared upper incisors due to prolonged Class II elastic wear, as the maxillary anterior segment was not adequately stabilized. Which diagnosis pertains to this unintended tooth movement?
(A) Anchorage loss in the anterior segment
(B) Posterior open bite
(C) Reverse curve of Spee
(D) True skeletal Class II discrepancy

165. A 16-year-old with mild anterior crowding refuses extractions. Which fixed appliance addition could create space by distalizing upper molars, avoiding premolar removal?
(A) Anterior elastics to the lower incisor brackets
(B) Micro-implant or temporary anchorage device (TAD)
(C) Gingivoplasty around the incisors
(D) Posterior bite block

166. According to contemporary guidelines, what is the recommended stance on prophylactic extraction of impacted third molars (wisdom teeth) to prevent crowding of lower incisors?
(A) Always extract impacted third molars before age 14
(B) Removal of third molars guarantees no late incisor crowding
(C) Routine prophylactic removal is not universally recommended
(D) Lower incisors never crowd regardless of third molar eruption

167. A 17-year-old in fixed treatment shows persistent root resorption on radiographs, disproportionately affecting multiple teeth. Which red flag must be investigated?
(A) Habitual mouth breathing
(B) Excessively high orthodontic forces or genetic predisposition
(C) Suboptimal bracket bonding technique
(D) Inadequate plaque control

168. Which key symptom might alert the orthodontist to a loose band on a posterior tooth?
(A) Sudden improvement in rotation
(B) Food entrapment and localized gingival inflammation
(C) Excessive torque on the anterior brackets
(D) Discoloration of elastomeric modules

169. Assertion: Stainless-steel crowns can be used as orthodontic band alternatives on posterior teeth.
Reason: Stainless-steel crowns provide an occlusal coverage that reduces the tooth's vertical dimension.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is NOT the correct explanation.
(C) Assertion is true, Reason is false.
(D) Assertion is false, Reason is true.

170. If an orthodontic bracket consistently debonds from a heavily restored tooth, what practical management measure can improve retention?
(A) Use of glass ionomer cement for bracket bonding
(B) Lightly sandblasting the restoration surface prior to bonding
(C) Immediate full-coverage crown placement
(D) Relying on chemical bonding to the composite only

171. Which radiograph is best to assess the position of orthodontic bands relative to the interproximal crestal bone level around molars?
(A) Bitewing radiograph
(B) Panoramic radiograph
(C) Lateral cephalogram
(D) Occlusal radiograph

172. A 15-year-old in fixed treatment reports persistent poking at the back of the mouth. Which component likely causes irritation if the wire extends beyond the distal molar tube?
(A) Powerchain
(B) Archwire
(C) Elastic chain hook
(D) Nance button

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173. A patient complains that their fixed appliance archwire keeps sliding from one side to the other, creating an uncomfortable offset. Examination shows no breaks in the wire or bracket but the archwire is undersized. Which solution most directly fixes this issue?
(A) Using a thicker archwire with stoppers
(B) Applying more Class II elastics
(C) Removing posterior bite blocks
(D) Replacing the bracket prescription

174. An adult patient with moderate crowding and older composite restorations experiences repeated bracket failures on these restored teeth. How can the clinician improve bracket retention in this specific scenario?
(A) Use a halogen light for curing
(B) Chemical etch the composite longer
(C) Microetch the restoration surface and apply a bonding agent
(D) Bond with glass ionomer cement

175. A 16-year-old complains of increased sensitivity around the upper first molars banded with an orthodontic appliance. Clinical examination reveals partial demineralization near the gingival margin. Plaque accumulation is noted under the band's edge. The dentist suspects microleakage under the band. Which management step directly addresses this complication?
(A) Reinforcing the archwire to reduce movement
(B) Sealing the band margin with a light-cured resin or removing and rebonding
(C) Prescribing systemic antibiotics
(D) Applying a fluoride varnish on the bracket slot

176. Which term describes the anchored device inserted into alveolar bone for temporary orthodontic anchorage, later removed once its purpose is fulfilled?
(A) Palatal implant
(B) Zygomatic plate
(C) Temporary anchorage device (TAD)
(D) Transpalatal bar

177. Where are TADs most commonly placed for en-masse retraction of anterior teeth in the upper arch?
(A) Directly on the palatal shelf
(B) Buccal alveolar bone between the second premolar and first molar
(C) In the mid-palatal suture
(D) Near the mental foramen

178. Why do TADs provide superior anchorage compared to conventional tooth-supported methods?
(A) TADs rely solely on alveolar bone, minimizing reciprocal tooth movement
(B) They are built from rubber-based materials for flexibility
(C) They are permanently integrated into the jaw, unlike conventional anchors
(D) TADs can never fail once inserted

179. All of the following are common indications for TAD use EXCEPT:
(A) Intrusion of overerupted molars
(B) Distalization of upper molars
(C) Surgical correction of skeletal Class III
(D) En-masse retraction of anterior teeth

180. What is a key difference between a palatal implant and a TAD (mini-screw) for orthodontic anchorage?
(A) Palatal implant is permanently integrated, TAD is removable
(B) Palatal implant always fails within six months
(C) TAD requires extensive palatal coverage
(D) TAD is only used in adult patients

181. A 17-year-old's upper first molars need to be intruded for occlusal plane correction. Which anchorage technique is most appropriate to reliably achieve molar intrusion?
(A) Class III elastics anchored on the lower arch
(B) Using facebow headgear 24 hours per day
(C) Inserting TADs in the buccal cortex near the molars
(D) Encouraging the patient to chew gum vigorously

182. A TAD placed between the roots of maxillary second premolar and first molar becomes loose after 2 months of en-masse retraction. What is the typical immediate management?
(A) Remove it and place a new TAD in an alternate location
(B) Force the screw deeper until it stabilizes
(C) Convert it to a palatal implant
(D) Continue using the loose TAD until space closure is complete

183. A patient has a TAD in place for anterior retraction. The surrounding gingiva becomes inflamed and bleeds upon probing. Which next step is generally recommended to maintain TAD success?
(A) Immediate removal of the TAD
(B) Enhanced oral hygiene and possible chlorhexidine rinses
(C) Advancing the TAD deeper into bone
(D) Ignoring the gingival issue as normal adaptation

184. In a fixed orthodontic appliance, what key action do coil springs serve when placed between brackets?
(A) They maintain minimal friction at the bracket interface
(B) They create either separation or retraction forces, depending on design
(C) They keep the archwire from flexing
(D) They primarily hold ligatures in place

185. Which action is INCORRECT when adjusting a closed-coil spring for space closure?
(A) Measuring the distance between brackets to ensure appropriate spring length
(B) Engaging the coil spring from one bracket hook to the other
(C) Overstretching the spring far beyond its working length
(D) Monitoring tension at subsequent visits

186. Which orthodontic auxiliary is most likely to be used for minor tooth rotation correction in the finishing stage?
(A) Elastomeric separators
(B) Rotation wedge or couple with a steel ligature
(C) Headgear bow
(D) Posterior bite block

187. Excessively tight orthodontic ligatures that are not replaced regularly can lead to which outcome?
(A) Expedited space closure
(B) Temporary anchorage device migration
(C) Increased plaque retention and potential gingival inflammation
(D) Posterior crossbite improvement

188. A 15-year-old in fixed braces presents with white spot lesions around several brackets. She has neglected brushing in those areas. Which primary factor explains why orthodontic appliances predispose to white spot formation?
(A) Fluoride overexposure near bracket resin
(B) Bacterial biofilm accumulation in bracket-periphery areas
(C) High salivary flow that erodes enamel
(D) Decreased carbohydrate intake

189. A patient has labial gingival recession on a canine after vigorous orthodontic expansion of the arch. Which diagnosis describes this recession caused by tooth movement outside the alveolar bone?
(A) Traumatic brushing recession
(B) Fenestration-induced root exposure
(C) Dehiscence-related recession
(D) Chemical erosion from mouthwash

190. A patient's archwire keeps disengaging from the molar tubes during mastication due to high occlusal forces. Which management choice is typically advised first?
(A) Overbend the wire so it stays in place by friction
(B) Switch to a larger bracket slot dimension
(C) Place bite turbos or build-ups to keep the wire out of occlusal contact
(D) Prescribe muscle relaxants

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191. According to standard finishing protocols in orthodontics, when are posterior elastics (Class II or III) typically discontinued?
(A) As soon as the desired molar relationship is initially achieved
(B) Only after occlusion is stable and the final tooth positions are confirmed
(C) Immediately after bonding fixed appliances
(D) Never, they are always continued post-retention

192. Which finding during routine orthodontic appointments might indicate a failing TAD that needs removal?
(A) Mild redness in the surrounding gingiva that resolves with cleaning
(B) Tight anchorage maintenance through space closure
(C) Frequent rotation of the TAD upon force application
(D) No clinical mobility but mild discomfort on brushing

193. A patient complains of their lips catching onto the brackets frequently, leading to irritation. Which bracket feature might be the cause?
(A) Low-profile bracket design
(B) Overly polished tie-wings
(C) Bracket hooks or sharp tie-wings
(D) Passive self-ligating clip

194. Assertion: Self-ligating brackets require fewer chairside ligature changes.
Reason: They eliminate the friction between bracket and archwire completely.
(A) Both Assertion and Reason are true, and Reason is the correct explanation.
(B) Both Assertion and Reason are true, but Reason is NOT the correct explanation.
(C) Assertion is true, Reason is false.
(D) Assertion is false, Reason is true.

195. If a self-ligating bracket's clip is jammed with calculus and cannot fully open, which immediate management is typically employed?
(A) Switch to a conventional bracket
(B) Attempt thorough cleaning with ultrasonic scaler or hand instrument
(C) Leave it jammed and do nothing
(D) Bond a bracket on top of the existing bracket

196. An orthodontist suspects root resorption in the maxillary central incisors during retraction. Which imaging modality provides a detailed 3D assessment of root integrity?
(A) Panoramic radiograph
(B) Periapical radiograph
(C) Cephalometric radiograph
(D) CBCT (Cone Beam Computed Tomography)

197. A new bracket design is tested for friction reduction. Laboratory tests show 30% less frictional resistance than standard brackets. Which mechanical advantage would most likely result from lower bracket-wire friction?
(A) Faster tooth movement
(B) Increased bracket breakage
(C) Higher torque expression
(D) Elevated risk of root resorption

198. A 14-year-old on nickel-titanium archwires reports allergies to certain metals. Orthodontic records show possible Ni sensitivity. Which archwire substitution is most appropriate to avoid nickel exposure but maintain flexibility in the initial alignment phase?
(A) Cobalt-chromium wire
(B) Beta-titanium (TMA) wire
(C) Round stainless-steel wire
(D) Gold-plated archwire

199. A 16-year-old with congenital enamel defects needs fixed orthodontics. Bracket bonding fails repeatedly on affected teeth. How can bonding be optimized to ensure greater bracket retention on hypoplastic enamel surfaces?
(A) Use conventional etch-and-bond alone
(B) Apply a self-etch primer only
(C) Use a specialized primer or conditioner for hypoplastic enamel
(D) Abandon fixed appliances altogether

200. An 18-year-old, nearing the end of orthodontic therapy, exhibits high canine brackets that never fully aligned with the archwire due to delayed eruption. Now that the canines are erupted enough, the dentist needs to reposition brackets for ideal finishing. However, the patient's schedule is tight, and compliance has been variable. Which approach most effectively ensures final correction of canine position without significantly prolonging overall treatment time?

(A) Debond entirely and place a removable aligner
(B) Rebond canines with precise bracket positioning and use finishing wires
(C) Extract the canines for quicker resolution
(D) Apply Class II elastics to the canines

END

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CHAPTER 09

PROSTHODONTICS AND CROWN & BRIDGE

1. What is the primary purpose of a preliminary impression in complete denture fabrication?
   (A) To fabricate a permanent denture base
   (B) To capture finer details of the residual ridges
   (C) To obtain an initial cast for custom tray fabrication
   (D) To finalize the occlusal plane orientation

2. Which impression material is most commonly used for making preliminary impressions in complete denture cases?
   (A) Polyvinyl siloxane
   (B) Alginate (Irreversible hydrocolloid)
   (C) Zinc oxide eugenol paste
   (D) Polyether

3. In complete denture prosthodontics, why is border molding performed during the final impression stage?
   (A) To establish the correct vertical dimension
   (B) To capture functional tissue extent and seal
   (C) To confirm jaw relation records
   (D) To locate the anatomic landmarks of the facebow

4. All of the following are advantages of the custom tray in complete denture impressions EXCEPT:
   (A) It allows precise border molding
   (B) It reduces the use of impression material
   (C) It provides uniform thickness of the impression
   (D) It automatically determines the occlusal vertical dimension

5. When comparing a single-step final impression technique with a two-step final impression technique for complete dentures, the two-step technique:
   (A) Reduces chairside adjustments but is more costly
   (B) Always eliminates the need for border molding
   (C) Provides less accuracy and requires fewer appointments
   (D) Eliminates the requirement for a custom tray

6. Which factor is considered critical for obtaining an accurate functional impression in complete denture prosthodontics?
   (A) Using a stiff impression material
   (B) Maintaining the functional border movements of soft tissues
   (C) Avoiding the inclusion of the vibrating line
   (D) Applying excessive pressure on tray seating

7. You are about to perform a border molding procedure. Which technique best ensures accurate peripheral extension for a complete denture?
   (A) Applying continuous heavy pressure with the tray
   (B) Using short, gentle muscle movements to shape borders
   (C) Rapidly removing and reinserting the tray multiple times
   (D) Limiting any movement of the patient's lips or cheeks

8. After making the final impression for a complete denture, you notice underextended borders in the maxillary buccal vestibule area. What is the best next step?
   (A) Proceed with the existing impression
   (B) Add impression material with a reline method around the underextended area

(C) Repeat the preliminary impression
(D) Extend the denture base after processing

9. What critical landmark must be identified on the maxillary final impression to ensure proper post-dam placement in complete denture fabrication?
(A) Hamular notch
(B) Canine eminence
(C) Midpalatine raphe
(D) Incisive papilla

10. During a final impression procedure for a complete denture, the following steps are performed. Which one is INCORRECT?
(A) Applying adhesive to the custom tray borders
(B) Having the patient perform functional movements to mold the material
(C) Trimming away all periphery to ensure no contact with tissues
(D) Establishing even spacer relief for the impression material

11. Excessive pressure applied during final impression making often leads to:
(A) Enhanced retention of the final prosthesis
(B) Functional sulcus depths that are accurately recorded
(C) Tissue rebound and eventual ill-fitting dentures
(D) Reduced time needed for final processing

12. A 65-year-old patient with severely resorbed mandibular ridges has faced chronic denture instability. Despite multiple denture relines and adjustments, the lower denture frequently dislodges during speech. The patient's tissues are healthy but exhibit minimal keratinized gingiva and a shallow vestibule.
What impression approach best addresses this challenging mandibular edentulous situation?
(A) Use of a stock tray with irreversible hydrocolloid only
(B) Functional impression with a soft-liner material over several days
(C) Single-step border molding with zinc oxide eugenol
(D) No impression modifications are required

13. Which anatomical condition is most likely diagnosed when the upper edentulous ridge shows excessive flabby tissue, often requiring a modified impression technique?
(A) Fibrous (Flabby) ridge
(B) Torus palatinus
(C) Enlarged incisive papilla
(D) Prominent maxillary tuberosities

14. For a patient exhibiting a flabby anterior maxillary ridge, which impression approach is most appropriate?
(A) High-viscosity impression material over the entire ridge
(B) Open-window technique or controlled relief over the flabby area
(C) Single-step irreversible hydrocolloid with heavy finger pressure
(D) Omit the anterior region from the final impression entirely

15. According to standard guidelines for complete denture impression procedures, how much relief space is typically recommended in a custom tray design?
(A) No relief space is needed
(B) Approximately 1–2 mm relief over the entire ridge
(C) 3–4 mm uniform relief in the posterior region only
(D) 5–6 mm relief in the anterior region

16. A patient complains of persistent burning sensation and pain in the maxillary anterior region under an old denture. Which red flag might you suspect before proceeding with new impression making?
(A) Progressive alveolar ridge resorption
(B) Oral candidiasis or denture stomatitis
(C) Improper selection of impression material
(D) Overextended posterior border

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17. Which clinical sign strongly suggests an overextended denture border in the maxillary vestibule?
(A) Excessive salivation
(B) Prominent midpalatal suture
(C) Tissue blanching at the labial sulcus on insertion
(D) Fracture of the denture base near the post-dam

18. Assertion (A): Post-insertion complaints of pain in the posterior palatal seal area often arise from an underextended seal.
Reason (R): The posterior palatal seal compensates for polymerization shrinkage and minor movements of the denture.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

19. For a patient with a known high palatal vault, which management consideration is crucial during the final impression stage of complete denture fabrication?
(A) Use a non-perforated stock tray only
(B) Extend the tray 10 mm beyond the vibrating line
(C) Incorporate a higher posterior palatal seal thickness
(D) Avoid border molding and rely on a passive fit

20. Which diagnostic test helps evaluate the proper posterior palatal seal area for a new maxillary complete denture?
(A) Phonetic test with the "S" sound
(B) Swallowing test to check seal retention
(C) Radiographic evaluation of the post-dam region
(D) Checking soft palate movement through the Valsalva maneuver

21. A 70-year-old edentulous patient presents for denture renewal. The previous denture lacked retention, frequently dropping during conversation and chewing.
What adjustment is most critical for improved retention?
(A) Increasing occlusal vertical dimension
(B) Correct border extension and posterior seal
(C) Using a stiffer denture base material
(D) Eliminating all compensatory curves

22. A 65-year-old patient complains that her existing dentures frequently move when she speaks or smiles. Examination reveals well-fitting denture bases with no sharp flanges. However, the border extensions seem short, especially in the maxillary buccal vestibule. The dentist plans to remake the upper impression.
Which step is essential?
(A) Replacing denture teeth with a harder material
(B) Emphasizing occlusal rest seats
(C) Thorough border molding with functional movements
(D) Using plaster impression material

23. A long-time denture wearer presents with repeated sore spots under a new complete denture. The dentist observes localized overextension in the retromolar pad area and suspect occlusal disharmony.
What is the first step in resolution?
(A) Adjust occlusion on the articulator
(B) Shorten the denture border near the retromolar pad
(C) Instruct the patient to continue wearing for adaptation
(D) Fabricate a new denture base

24. A 72-year-old patient presents with a history of ill-fitting complete dentures worn for almost 10 years. Examination reveals abused tissues: inflamed mucosa, papillary hyperplasia in the palate, and exostoses. The new dentures require an exceptionally careful impression technique, especially around the sensitive tissues. The dentist plans to use a tissue-conditioning liner over the next two weeks to allow mucosal healing.
Which final impression strategy is most appropriate after tissue recovery?
(A) High-pressure impression
(B) Mucostatic impression technique
(C) Single-step irreversible hydrocolloid
(D) Use of plaster wash

25. What is "centric relation" (CR) in the context of complete denture jaw relation records?
(A) The contacting position of the upper and lower teeth in maximum intercuspation
(B) The mandible's position when the condyles are in the most unstrained, superior-anterior position in the glenoid fossa
(C) The protrusive position dictated by incisal guidance
(D) The position established purely by patient comfort

26. Which device is commonly used to record centric relation for edentulous patients?
(A) Gothic arch tracer
(B) Pantograph
(C) Facebow
(D) Pulp tester

27. Why is centric relation (CR) considered a crucial reference in complete denture prosthodontics?
(A) It automatically dictates the final esthetics of the denture
(B) It helps ensure the denture teeth align with the pupillary line
(C) It is a reproducible mandible-to-maxilla relationship
(D) It guarantees the maximum intercuspation

28. All of the following methods can be used to record vertical dimension of occlusion (VDO) in an edentulous patient EXCEPT:
(A) Phonetic evaluation of sibilant sounds
(B) Facial measurements at rest and in occlusion
(C) Using the patient's old dentures alone without clinical verification
(D) Assessing interocclusal distance at rest

29. Comparing the use of a wax rim technique for jaw relation records with using an existing denture for these records, one key advantage of wax rims is:
(A) They provide an automatic facebow transfer
(B) They eliminate the need for centric relation verification
(C) They offer adjustable occlusal plane and vertical dimension
(D) They cannot accommodate any esthetic assessments

30. A patient's rest vertical dimension (RVD) is measured at 65 mm, while the interocclusal rest space is ideally 2–4 mm. What is the most suitable calculated occlusal vertical dimension (OVD) for this patient?
(A) 61–63 mm
(B) 65 mm
(C) 66–68 mm
(D) 59–60 mm

31. When using phonetics to confirm the vertical dimension in an edentulous patient, which sound is particularly helpful?
(A) "M" sound
(B) "Ch" sound
(C) "S" sound
(D) "P" sound

32. After setting the proposed occlusal vertical dimension, the patient reports strain and discomfort while speaking. What is the best next step?
(A) Increase the OVD further
(B) Decrease the OVD slightly and reevaluate
(C) Schedule immediate processing of the dentures
(D) Perform an alveoloplasty

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33. Which jaw relation record is crucial for orienting the maxillary cast to the hinge axis?
(A) Interocclusal centric record
(B) Protrusive record
(C) Facebow transfer
(D) Lateral excursive record

34. During a jaw relation appointment, a dentist undertakes the following steps. Which step is INCORRECT?
(A) Adjusting wax rims to establish appropriate lip support
(B) Recording the centric relation with the patient's jaws slightly parted
(C) Verifying the occlusal plane with reference to the ala-tragus line
(D) Confirming sufficient freeway space through phonetic checks

35. If the vertical dimension of occlusion is set too high, what is a likely outcome?
(A) Improved esthetics and comfort
(B) Excessive interocclusal rest space
(C) TMJ discomfort and muscular strain
(D) Increased freeway space

36. A 68-year-old edentulous patient arrives with severe alveolar ridge resorption and a collapsed lower facial height. The new prosthesis must restore esthetics, function, and comfort. Current wax rims reveal the patient's lips cannot fully close without straining, and speech is impaired. The dentist suspects an excessive vertical dimension.
Which immediate adjustment is indicated?
(A) Increase the freeway space by reducing wax rim height
(B) Take a facebow transfer right away
(C) Proceed with final mounting on the articulator
(D) Add more wax to the occlusal rims

37. In evaluating esthetics, a dentist notices that the patient's upper lip lacks adequate support at rest. Which specific diagnosis or correction is implied?
(A) The vertical dimension of occlusion is too high
(B) The wax rim is undercontoured in the labial region
(C) The occlusal plane is set too high posteriorly
(D) The mandibular rim is overextended lingually

38. After establishing jaw relations with the wax rims, the dentist plans to send the case for mounting on a semi-adjustable articulator. Which additional record is often needed?
(A) Zinc oxide eugenol wash record
(B) Facebow transfer record
(C) Balanced occlusion record
(D) Arbitrary protrusive record

39. According to prosthodontic guidelines, how should the dentist confirm adequate interocclusal distance during wax rim try-in?
(A) Rely solely on the old dentures
(B) Use phonetics, especially sibilant sounds, and observe relaxation of lips
(C) Direct the laboratory to finalize the denture without patient input
(D) Perform alveolar ridge augmentation surgery

40. Assertion (A): The facebow transfer is an optional step that may be omitted if the dentist prefers.
Reason (R): A facebow transfer helps mount the maxillary cast in the same spatial relationship to the hinge axis as it exists in the patient.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

41. A 69-year-old edentulous patient has consistent difficulty pronouncing "S" and "CH" sounds during the wax trial. The rims touch prematurely, causing clicking.
What adjustment is indicated?
(A) Decreasing OVD slightly
(B) Increasing OVD further
(C) Changing the posterior palatal seal
(D) Altering the centric relation

42. During the jaw relation appointment, a 70-year-old patient mentions discomfort in the TMJ area whenever the wax rims are brought into contact. He also experiences a clicking sound upon closure. Clinical observation suggests the vertical dimension might be set too high.
What modification should be performed first?
(A) Add wax to the upper rim
(B) Remove wax from the lower rim
(C) Insert a soft liner
(D) Immediately mount and process the dentures

43. A patient with newly fabricated complete dentures complains of excessive fullness in the upper lip and difficulty closing the mouth. Examination reveals the dentist established an inaccurate occlusal vertical dimension and labial contour.
Which corrective action is most suitable?
(A) Increase the vertical dimension more
(B) Reduce wax in the labial flange region and lower the occlusal rims
(C) Perform alveoloplasty to decrease ridge height
(D) Proceed with finish and insertion

44. A 75-year-old patient presents with advanced alveolar ridge resorption and complains of chronic TMJ discomfort. On examination, the old dentures appear worn, leaving the patient with an overclosed appearance. When the dentist fabricates new rims, phonetic testing reveals a "th" sound that is muffled, and the lower face height looks more natural but still slightly collapsed. The dentist suspects an inadequate vertical dimension.
Which plan of action is justified to optimize function and reduce TMJ strain?
(A) Increasing the OVD to restore a healthier rest space
(B) Finalizing the occlusion at the current OVD
(C) Decreasing the OVD further for safety
(D) Adding posterior palatal seal thickness

45. All of the following contribute to proper esthetics in complete denture fabrication EXCEPT:
(A) Adequate labial fullness
(B) Appropriate tooth selection for shape and shade
(C) Overextension of the maxillary flanges
(D) Correct occlusal plane orientation

46. When selecting anterior teeth for complete dentures, which factor most influences esthetic integration?
(A) The patient's preference alone
(B) Replicating the size and form of the old dentures without question
(C) Matching tooth form to the patient's facial form and arch size
(D) Using only a single universal shade

47. If a patient desires a youthful smile appearance from their new complete dentures, which tooth arrangement principle is generally applied?
(A) Positioning anterior teeth on the ridge crest for maximum function
(B) Minimal incisal display with reduced visibility of upper teeth
(C) Slight diastemas and correct inclination for a natural appearance
(D) Inclining all anterior teeth lingually to reduce visibility

48. During the anterior try-in, you notice the midline of the denture teeth is shifted 2 mm to the patient's left compared to the facial midline. The patient is unhappy with the appearance. What is the best next step?
(A) Proceed to final processing and adjust post-insertion
(B) Re-record centric relation
(C) Reset and re-align the anterior teeth midline in wax
(D) Tell the patient it is not noticeable

49. The following procedures are performed during the anterior tooth try-in for complete dentures. Which one is INCORRECT?
(A) Checking midline alignment with the facial midline
(B) Evaluating the incisal plane against the interpupillary line
(C) Ignoring the patient's feedback on esthetics
(D) Assessing the fullness of the upper lip

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50. Assertion (A): Denture esthetics relies solely on mechanical occlusal balance.
Reason (R): Esthetics in denture construction involves tooth arrangement, lip support, midline orientation, and overall harmony with facial features.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

51. A patient returns for a 24-hour post-insertion check of new complete dentures. He reports soreness on the lingual side of the mandibular denture and difficulty swallowing. Examination shows the lingual flange contacting the floor of the mouth during tongue movements.
Which immediate adjustment is indicated?
(A) Shorten the lingual flange
(B) Increase the vertical dimension of occlusion
(C) Add a tissue conditioner
(D) Encourage the patient to adapt over time

52. All of the following are recommended practices during complete denture insertion EXCEPT:
(A) Checking for pressure spots using pressure-indicating paste
(B) Refining the occlusion in both centric and eccentric movements
(C) Ensuring correct extension of borders without overextension
(D) Immediately advising permanent relining of a brand-new denture

53. How often are routine post-insertion follow-up appointments typically scheduled in the initial weeks after delivering complete dentures?
(A) 24 hours, 1 week, and 1 month
(B) 24 hours, 3 days, and 6 months
(C) 3 days, 2 weeks, and 3 months
(D) 1 week and then yearly

54. Comparing balanced occlusion to monoplane occlusion in complete denture setup, balanced occlusion:
(A) Reduces the need for accurate centric relation
(B) Minimizes dislodgment during lateral and protrusive movements
(C) Eliminates the need for posterior teeth compensating curves
(D) Encourages a flat plane with no compensatory cusp angles

55. In complete denture balanced occlusion, which factor is manipulated to maintain simultaneous tooth contact in eccentric movements?
(A) Vertical dimension of occlusion
(B) Hanau's Quint components like compensating curve
(C) Interpupillary line orientation
(D) Facial midline setting

56. Excessive incisal guidance in complete dentures often leads to:
(A) Improved comfort during mastication
(B) Reduced need for compensating curves
(C) Increased dislodging forces during protrusion
(D) More stable posterior occlusal contact

57. A 66-year-old patient wearing complete dentures complains of discomfort when biting into food. Examination shows the incisal guidance is extremely steep.
Which corrective measure might help?
(A) Increase incisal guidance further
(B) Decrease incisal guidance and refine compensating curves
(C) Eliminate centric relation
(D) Add more vertical dimension

58. When delivering complete dentures with a fully balanced occlusion scheme, what is the primary benefit?
(A) Simplified laboratory procedures
(B) Decreased muscle fatigue during mastication
(C) Reduced cost of denture fabrication
(D) Absolute elimination of any occlusal discrepancies

59. A patient with newly placed complete dentures experiences frequent denture base dislodgement during side-to-side jaw movements. Which occlusal scheme adjustment can help mitigate this?
(A) Increasing the compensating curves
(B) Flattening the occlusal plane entirely
(C) Raising the incisal edges to contact sooner
(D) Eliminating posterior tooth contacts in lateral movements

60. A 70-year-old edentulous patient with advanced bone resorption on both arches reports that her new complete dentures feel unstable during talking and chewing. On examination, the dentist notes minimal alveolar ridges and a monoplane occlusal setup. The dentist decides to incorporate bilateral balanced articulation.
What is the intended outcome?
(A) Less posterior tooth contact
(B) Enhanced denture stability via simultaneous contacts in excursions
(C) Reduced cost due to simplified tooth setup
(D) Elimination of incisal edges from functional contact

61. What is a removable partial denture (RPD)?
(A) A fixed prosthesis replacing multiple missing teeth by bonding
(B) A prosthesis replacing missing teeth that the patient cannot remove
(C) A dental prosthesis replacing one or more teeth, easily removed by the patient
(D) A single-unit restoration cemented permanently

62. Which major component of a removable partial denture primarily provides vertical support on the edentulous ridge?
(A) Major connector
(B) Occlusal rest
(C) Retentive clasp arm
(D) Guide plate

63. What is the principal function of a major connector in a removable partial denture design?
(A) To directly engage undercuts for retention
(B) To provide a rigid link between the RPD components
(C) To seat on the occlusal surface of an abutment tooth
(D) To displace gingival tissue for better adaptation

64. All of the following are acceptable major connectors for a maxillary removable partial denture EXCEPT:
(A) Palatal strap
(B) Palatal plate
(C) Lingual bar
(D) Anterior-posterior palatal strap

65. Compared to a wide palatal strap major connector, a horseshoe (U-shaped) major connector in a maxillary RPD:
(A) Provides better support in cases of torus palatinus
(B) Is always thinner and requires less rigidity
(C) Offers more extensive coverage of the palate
(D) Is recommended when maximum rigidity is needed

66. Which design feature best enhances patient comfort and health of the gingival tissues in a mandibular removable partial denture?
(A) Using a wide lingual plate that covers all lingual surfaces
(B) Placing a lingual bar at least 3–4 mm away from the gingival margin
(C) Positioning an occlusal rest half on tooth structure, half on gingiva
(D) Using a flexible plastic major connector that touches soft tissue

67. During the design of a removable partial denture, the following principles are considered. Which step is INCORRECT?
(A) Surveying the diagnostic cast to locate suitable undercuts
(B) Placing all retentive clasps in the same undercut depth
(C) Designing rest seats on abutment teeth
(D) Establishing a path of placement that ensures minimal tooth interference

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68. According to standard guidelines, what is the minimum vertical clearance usually recommended for a lingual bar in a mandibular RPD?
(A) 2 mm
(B) 3 mm
(C) 4 mm
(D) 7 mm

69. A patient needs a mandibular RPD with missing teeth in the posterior segments. A shallow floor of the mouth makes placing a standard lingual bar difficult. What design might be best?
(A) Sublingual bar
(B) Horseshoe connector
(C) Broad palatal strap
(D) Incisal rest only

70. A 60-year-old patient has Kennedy Class III edentulous spaces in the lower jaw (missing left molars). The dentist's exam reveals good canine abutments on both sides. The periodontal health is stable, but the patient's floor of the mouth is relatively high. Which major connector is most suitable?
(A) Standard lingual bar
(B) Cingulum bar
(C) Lingual plate
(D) Labial bar

71. What is an "indirect retainer" in a removable partial denture framework?
(A) A rest that prevents movement of the distal extension base away from the tissues
(B) A direct clasp engaging an undercut for retention
(C) A minor connector that attaches the denture base to the major connector
(D) A posterior palatal seal used in the maxilla

72. Which Kennedy classification describes a partially edentulous arch with a single, unilateral edentulous area bounded by natural teeth?
(A) Class I
(B) Class II
(C) Class III
(D) Class IV

73. Why does a distal extension RPD require special attention to support compared to a bounded RPD?
(A) It has a palatal plate that prevents movement
(B) The distal extension lacks a tooth for vertical support at its far end
(C) It always involves a maxillary arch only
(D) Bounded edentulous areas have fewer retentive options

74. All of the following are commonly used clasps in RPD design EXCEPT:
(A) Circumferential (Akers) clasp
(B) Bar (Roach) clasp
(C) Half-and-half clasp
(D) Magnetic clasp

75. How does a bar (Roach) clasp differ from a circumferential (Akers) clasp in RPD design?
(A) Bar clasps originate from the occlusal surface, while circumferential clasps begin at the gingival margin
(B) Bar clasps engage undercuts from below the survey line, while circumferential clasps approach from above
(C) There is no functional difference between bar and circumferential clasps
(D) Circumferential clasps always use stainless steel, while bar clasps must be gold alloy

76. In designing an RPD clasp assembly, which principle helps avoid excessive force on the abutment tooth?
(A) Choosing the largest possible undercut for maximum retention
(B) Using flexible clasp arms that only engage mild undercuts
(C) Placing rests on gingival tissue instead of teeth
(D) Eliminating minor connectors entirely

77. A dentist is designing a mandibular RPD for a patient with moderately tilted mandibular molar abutments. To compensate for the tilt and ensure proper path of placement, which component modification is often required?
(A) Using a parallel-sided major connector
(B) Employing an altered cast technique
(C) Preparing guide planes on the proximal surfaces of the tilted teeth
(D) Eliminating rests on the tilted abutments

78. While fabricating an RPD for a bilateral free-end (Class I) case, the following steps are performed. Which is INCORRECT?
(A) Using an altered cast impression technique for the distal extension segments
(B) Designing broad stress distribution via indirect retainers
(C) Using infra-bulge (bar) clasps for additional retention
(D) Relying solely on the major connector for vertical tissue support

79. According to standard guidelines, how wide should a rest seat on an occlusal surface generally be?
(A) One-third the buccolingual width of the tooth
(B) The entire occlusal table
(C) Less than 1 mm wide
(D) It must extend over the marginal ridge by 3 mm

80. During an RPD design consultation, the dentist observes inflamed, hyperplastic tissue in the edentulous areas. Which red flag condition should be ruled out before finalizing the denture?
(A) Well-controlled diabetes
(B) Oral candidiasis or epulis fissuratum
(C) Periodontally stable abutment teeth
(D) Presence of minor tori

81. Which clinical sign often indicates an overextended RPD flange in the mandibular vestibule?
(A) Excessive mobility of the anterior teeth
(B) Blanching or ulceration of the vestibular mucosa upon insertion
(C) Rapid calculus formation on the framework
(D) Premature occlusal contact in centric relation

82. Assertion (A): An RPD with a properly placed occlusal rest directs forces down the long axis of the abutment tooth.
Reason (R): Occlusal rests prevent the denture from depressing soft tissues excessively, improving biomechanical function.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

83. A patient presents with an existing RPD that repeatedly fractures at the major connector junction. After ensuring the occlusion is not excessive, what design modification can improve resistance to framework fracture?
(A) Thinning the major connector for flexibility
(B) Incorporating a metal reinforcement or thicker major connector
(C) Switching all rest seats to the lingual surfaces
(D) Removing indirect retainers to reduce metal components

84. Which diagnostic tool is particularly helpful in verifying the path of insertion and undercut areas for an RPD design?
(A) Panoramic radiograph
(B) Facebow transfer
(C) Dental surveyor
(D) Alginate impression

85. A 58-year-old patient's RPD frequently dislodges during function. Examination shows polished surfaces contacting the buccal vestibule under tension.
What adjustment is most critical for improved retention?
(A) Shortening the occlusal rests
(B) Relieving the overextended flange in the buccal vestibule
(C) Creating deeper undercuts on abutment teeth
(D) Adding more teeth to the partial

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86. A patient with a Kennedy Class II mandibular RPD complains that the denture base lifts when biting on the extension side. The dentist notes the indirect retainer is positioned on a premolar but shows minimal seating.
Which modification will likely improve stability?
(A) Moving the indirect retainer more anterior
(B) Thickening the lingual bar
(C) Using only circumferential clasps
(D) Removing the rest seat entirely

87. A 62-year-old patient returns complaining of soreness under a new mandibular RPD covering the distolingual aspect of her last standing molar. Examination reveals the metal framework impinges on the lingual tissues.
What initial solution is most appropriate?
(A) Apply tissue conditioner
(B) Adjust and relieve the impinging framework
(C) Prescribe systemic antibiotics
(D) Add an extra occlusal rest

88. A 70-year-old patient with missing lower right molars (Kennedy Class II) has difficulty seating her RPD fully. The abutment premolar features a modest buccal undercut, and the dentist notices the retentive clasp arm struggles to pass over the height of contour. Upon further inspection, the path of insertion seems hindered by a tall marginal ridge on the second premolar.
Which approach is best to ensure the framework seats properly without excessive force on the clasp?
(A) Reduce the marginal ridge height
(B) Switch to a labial bar connector
(C) Increase vertical dimension of occlusion
(D) Eliminate the clasp design

89. What is the "altered cast technique" in RPD fabrication?
(A) A method to record alveolar ridge detail after the metal framework is tried in
(B) A way to mount casts in centric relation without a facebow
(C) An approach where the framework is fabricated directly in the mouth
(D) A process of relining the complete denture immediately post-insertion

90. When performing the altered cast technique, which material is often used for the corrective (functional) impression of the distal extension area?
(A) ZOE paste
(B) Plaster of Paris
(C) Polysulfide rubber base
(D) Clear acrylic resin

91. Why is the altered cast technique particularly recommended for distal extension RPDs?
(A) It allows immediate tooth replacement without a lab step
(B) It ensures a more accurate adaptation of the prosthesis on compressible tissues
(C) It eliminates the need for rest seats
(D) It shortens the treatment timeline significantly

92. All of the following procedures are benefits of a trial insertion of the RPD metal framework EXCEPT:
(A) Confirming the path of placement
(B) Checking retention and stability
(C) Immediately adding artificial teeth and final polishing
(D) Detecting areas that bind or overextend

93. Compared to a complete denture, a removable partial denture generally:
(A) Has fewer esthetic considerations since not all teeth are replaced
(B) Places more stress on the alveolar ridge due to full coverage
(C) Relies on support from both teeth and residual ridge tissues
(D) Eliminates the need for occlusal adjustments entirely

94. Which factor primarily dictates the path of placement for an RPD framework?
(A) Lab technician preference
(B) Natural tooth contours and guide plane preparation

(C) The major connector's thickness
(D) The color of acrylic used for the denture base

95. You are planning an RPD for a patient with missing lower first molars bilaterally (Kennedy Class III mod 1). After surveying, you notice the second premolars have distinct mesial undercuts. How can you best utilize them for retention?
(A) Position a bar clasp from the mesial approach
(B) Grind away the undercuts for a flat surface
(C) Use a modified T-bar or reverse circlet clasp to engage the mesial undercut
(D) Disregard the undercuts and rely on lingual rests

96. A final RPD framework fits well on the cast, but intraoral try-in shows it binding on an abutment's proximal surface. What is the best next step?
(A) Send it for finishing and polishing
(B) Adjust the abutment tooth intraorally using fine burs
(C) Ask the patient to force it in repeatedly until it seats
(D) Dismiss the patient and rely on the lab cast accuracy

97. Which feature of an RPD design primarily prevents rotation around the distal abutment in a Class I scenario?
(A) Retentive clasp on the distal-most tooth
(B) Indirect retainer placed anterior to the fulcrum line
(C) Polishing the framework to a high shine
(D) Adding a second major connector

98. During the final try-in of an RPD before processing, the following steps are performed. Which one is INCORRECT?
(A) Verifying occlusal contacts with articulating paper
(B) Checking the relationship of the framework to soft tissues
(C) Finalizing prosthetic tooth positions on the wax trial
(D) Skipping patient input on esthetics if the design is clinically acceptable

99. If a mandibular RPD lacks adequate bracing and reciprocal components, what is a likely outcome?
(A) The framework seats more passively
(B) Teeth adjacent to the edentulous area may experience damaging lateral forces
(C) Increased undercut utilization for retention
(D) Less need for clasps

100. Assertion (A): A well-designed RPD should distribute masticatory forces to both abutments and supporting tissues.
Reason (R): Proper rests, connectors, and clasps help prevent undue stress concentration on any single component.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

101. What is a fixed partial denture (FPD) in restorative dentistry?
(A) A prosthesis replacing one or more missing teeth, removable by the patient
(B) A cast metal or porcelain restoration permanently cemented to abutment teeth
(C) A direct restoration placed into prepared tooth structure without a laboratory step
(D) A short-term acrylic appliance used for diagnostic purposes

102. Which component of an FPD primarily anchors the prosthesis to an abutment tooth?
(A) Pontic
(B) Retainer
(C) Connector
(D) Die spacer

103. Why must the abutment teeth in an FPD be prepared with a specific taper and axial reduction?
(A) It simplifies the laboratory procedures by providing identical contours for all crowns
(B) It ensures adequate retention and resistance form for the final restoration

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(C) It allows minimal clearance for the restoration, preserving maximum tooth structure
(D) It prevents any stress distribution within the abutment

104. All of the following are critical principles in fixed partial denture tooth preparation EXCEPT:
(A) Adequate occlusal clearance
(B) Minimal functional cusp bevel
(C) Appropriate margin design
(D) Maximum retention with zero taper

105. Compared to a full metal crown, a porcelain-fused-to-metal (PFM) retainer for an FPD generally requires:
(A) Less occlusal reduction
(B) Similar occlusal clearance but more axial reduction for porcelain
(C) A chamfer margin only, with no need for a shoulder
(D) No distinct difference in preparation guidelines

106. In preparing a full coverage crown for an FPD abutment tooth, why is a functional cusp bevel created?
(A) To preserve as much tooth structure as possible
(B) To ensure adequate thickness of the restorative material in heavy occlusal load areas
(C) To facilitate easier removal of the temporary crown
(D) To shift contact more lingually and reduce loading

107. After preparing an abutment tooth for a full-coverage PFM retainer, the dentist measures the buccal axial reduction to be only 0.5 mm. What is the best corrective action?
(A) Proceed with final impressions
(B) Increase buccal reduction to about 1.2 mm for porcelain
(C) Switch to a full metal crown design
(D) Omit porcelain on the buccal surface

108. During FPD abutment preparation, the dentist encounters significant caries extending subgingivally on a proximal aspect. What is the most appropriate next step?
(A) Finish the prep as is and take impressions
(B) Place a core build-up with crown lengthening or orthodontic extrusion if needed
(C) Selectively remove the infected dentin but leave the subgingival margin
(D) Abandon the tooth and prepare an adjacent tooth instead

109. What key feature must be established when preparing finish lines for an FPD abutment crown?
(A) A feather edge margin to conserve maximum tooth structure
(B) A distinct, continuous circumferential finish line with adequate thickness
(C) Placing the margins 4 mm above the gingival crest
(D) Having no margin on the proximal surfaces

110. During tooth preparation for an FPD retainer, these steps are performed. Which is INCORRECT?
(A) Establishing the depth cuts on the occlusal surface first
(B) Creating a uniform axial reduction respecting the long axis of the tooth
(C) Leaving a rough, irregular finish line to enhance mechanical retention
(D) Placing a finish line at or slightly subgingival where needed

111. Insufficient occlusal clearance during an FPD abutment preparation often results in:
(A) Overcontoured final restoration
(B) Better esthetic outcome
(C) Enhanced strength of the crown
(D) Elimination of the need for occlusal adjustment

112. A 55-year-old patient presents for a 3-unit FPD to replace a missing lower first molar. The dentist prepares the second premolar and second molar as abutments. Intraoral evaluation reveals a limited interarch space due to overeruption of the opposing tooth. Minimal occlusal reduction is achieved before encountering the pulp horn.
Which solution best addresses this problem?
(A) Placing a crown with minimal thickness and no metal framework
(B) Performing elective endodontics followed by a cast post
(C) Reducing the opposing tooth or considering enameloplasty
(D) Temporarily placing an onlay restoration and reevaluating

113. A dentist observes that one of the planned FPD abutment teeth has severe cervical abrasion with dentinal hypersensitivity. Which approach is most suitable for this abutment?
(A) Omit that abutment from the FPD design
(B) Provide a full-coverage crown with a subgingival margin that encompasses the abrasion
(C) Use only a partial veneer and rely on dentin bonding for retention
(D) Bond an inlay to cover the cervical lesion

114. If a short clinical crown does not provide enough retention for an FPD retainer, which procedure is commonly performed?
(A) Gingivoplasty only
(B) Adding an incisal rest on the abutment
(C) Crown lengthening surgery or orthodontic extrusion
(D) Using no preparation and relying on partial coverage

115. According to standard guidelines, what is the minimal total occlusal convergence (TOC) or taper recommended for a full coverage crown preparation?
(A) 0–2 degrees per axial wall
(B) 6–10 degrees per axial wall
(C) 15–20 degrees per axial wall
(D) Over 25 degrees per axial wall

116. During abutment preparation for an FPD, the dentist notes a large radiolucency near the pulp. Which concern must be ruled out before proceeding?
(A) Gingival recession
(B) Pulpal necrosis or irreversible pulpitis
(C) Sinus perforation
(D) Impacted supernumerary tooth

117. After preparing a tooth for an FPD retainer, the patient complains of lingering pain to cold stimuli. Which clinical sign might indicate a potential pulp exposure or irritation?
(A) Transient sensitivity lasting under 5 seconds
(B) Prolonged throbbing sensation persisting over 30 seconds
(C) Mild discomfort relieved by removing the temporary crown
(D) Sensitivity only when biting into hard foods

118. Assertion (A): Beveling the margins of a full metal crown preparation can enhance the final adaptation.
Reason (R): A beveled margin in a porcelain restoration reduces the risk of porcelain fracture significantly.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

119. A patient has a deep subgingival margin on the mesial side of an FPD abutment. To ensure adequate isolation for final impression and to prevent violation of biologic width, the dentist might:
(A) Proceed with the final impression as is
(B) Use a copper band technique without tissue retraction
(C) Perform crown lengthening or gingivectomy prior to the final impression
(D) Place the margin even deeper to bury it

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120. Which diagnostic method is most effective for evaluating the occlusal clearance after tooth preparation for an FPD retainer?
(A) Explorer tip check
(B) Visual inspection without any device
(C) Silicone putty "bite check" or clearance gauge
(D) Thermal pulp testing

121. A 58-year-old patient's FPD abutment prep shows a slight undercut on the buccal aspect. The lab suggests path of insertion issues.
What immediate modification is indicated?
(A) Add composite at the undercut
(B) Reduce buccal surface more to eliminate the undercut
(C) Prepare a groove on the lingual surface
(D) Select a shorter path of insertion

122. A 52-year-old patient has prepared abutments for a 3-unit FPD. The lab complains that the two abutments have divergent paths of insertion: the premolar is mesially tilted, while the molar is upright. The lab can't fabricate a single casting that seats fully.
Which solution is most appropriate?
(A) Request the lab "force" a single path of insertion
(B) Prepare a new partial coverage on the premolar
(C) Perform minor tooth preparation modifications to align both abutments
(D) Shorten the pontic length

123. A patient's abutment preparation for a 4-unit FPD has minimal interproximal spacing to pass floss. The patient later develops persistent gingival inflammation.
Which preventive measure should have been prioritized during final margin placement?
(A) Adequate interdental embrasure design
(B) Eliminating functional cusp bevel
(C) Using only supra-gingival margins
(D) Flattening the occlusal table

124. A 67-year-old patient with multiple missing posterior teeth requests an FPD instead of a removable prosthesis. The dentist prepares two terminal abutments, each supporting a 3-unit extension. However, the final impression reveals the arch length would require a long-span 6-unit bridge. The dentist worries about flexure and potential failure.
Which engineering or design modification can reduce the risk of such long-span FPD complications?
(A) Using a non-rigid connector near the middle of the span
(B) Employing only partial coverage rest seats
(C) Leaving minimal clearance to stiffen the pontic
(D) Relying on purely adhesive resin bonding

125. What is a "connector" in fixed partial denture terminology?
(A) The metal or porcelain substructure that replaces the missing tooth
(B) The portion of the FPD that unites the pontic with the retainer
(C) A temporary device used for trial insertion
(D) A rubber separator used during crown fabrication

126. Which pontic design is best for the anterior region when aiming for optimal esthetics and hygiene?
(A) Ridge lap pontic
(B) Modified ridge lap pontic
(C) Conical pontic
(D) Sanitary/hygienic pontic

127. Why is a sanitary (hygienic) pontic commonly used in posterior FPDs?
(A) It provides the most realistic gum contact
(B) It reduces food impaction by fully contacting the ridge
(C) It forms a space between pontic and tissue for easy cleaning
(D) It is mandatory for maxillary anterior replacements

128. All of the following are acceptable pontic designs in FPD construction EXCEPT:
(A) Modified ridge lap
(B) Ovate
(C) Saddle pontic
(D) Conical

129. Compared to a modified ridge lap pontic, an ovate pontic design:
(A) Floats above the tissue with no contact
(B) Requires a socket-like depression in the alveolar ridge
(C) Is purely for posterior FPDs
(D) Lacks esthetic advantages

130. When planning a pontic design for a maxillary anterior FPD where the ridge is well-formed, which option typically yields the most natural emergence profile?
(A) Hygienic pontic
(B) Modified ridge lap pontic
(C) Conical pontic
(D) Ovate pontic

131. A patient's alveolar ridge is slightly deficient after extraction, making a planned ovate pontic seat challenging. Which procedure can help create a suitable site for an ovate pontic?
(A) No surgical intervention is possible
(B) Guided tissue regeneration to build up the ridge
(C) Placing a conical pontic without contact
(D) Using a broad sanitary pontic design

132. After preparing the abutments and before fabricating the final FPD, the dentist wants to protect the prepared teeth. Which step is crucial?
(A) Leaving the abutments exposed to promote pulp vitality checks
(B) Placing provisional restorations to maintain tooth position and occlusion
(C) Immediately cementing the permanent crowns to see if they fit
(D) Covering the prepared surfaces with a fluoride varnish alone

133. Which primary function do provisional restorations serve in an FPD treatment sequence?
(A) Finalizing the permanent occlusion
(B) Enhancing plaque accumulation temporarily
(C) Protecting prepared teeth and maintaining aesthetics
(D) Testing future implant sites

134. During provisional restoration fabrication for a multi-unit FPD, which one is INCORRECT?
(A) Using a preformed crown form or a matrix for shaping
(B) Trimming and polishing the margins carefully
(C) Leaving open proximal contacts to prevent impingement on neighboring teeth
(D) Checking occlusion and ensuring no heavy contact

135. If the provisional FPD is left in supra-occlusion (too high), what is a likely outcome?
(A) Improved retention of the final FPD
(B) More rapid gingival healing
(C) Occlusal trauma and possible patient discomfort
(D) Beneficial relief of the abutment teeth

136. A 65-year-old patient returns 2 weeks after abutment preparation and provisional placement for a 3-unit maxillary FPD. He complains of gum soreness around the provisional. Examination reveals overextended margins impinging on the sulcus, with inflamed gingiva. The dentist recognizes the need to refine the temporary restoration or remake it.
Which rationale underpins this decision?
(A) Ensuring biologic width violation continues for full gingival coverage
(B) Accepting mild gingival inflammation because it's temporary
(C) Maintaining healthy soft tissues is essential for an accurate final impression
(D) Overextended provisionals improve retention of the final prosthesis

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137. A patient's provisional FPD is repeatedly fracturing at the connector site. Which underlying issue is most likely?
(A) The connector cross-section is too thin
(B) The occlusal clearance is excessive
(C) The use of acrylic resin instead of composite resin
(D) The embrasures are overcontoured

138. A dentist wants to strengthen a provisional FPD for a patient with heavy occlusal forces. Which step is recommended?
(A) Using a soft liner beneath the provisional
(B) Incorporating a metal or fiber reinforcement in the provisional
(C) Eliminating all occlusal contact
(D) Placing a partial coverage restoration instead

139. According to conventional guidelines, what is an acceptable finish line design for an all-ceramic FPD retainer?
(A) Heavy chamfer or rounded shoulder
(B) Feather edge margin
(C) Metal collar margin
(D) Knife-edge margin

140. Assertion (A): A die spacer is applied during crown fabrication.
Reason (R): The die spacer compensates for the thickness of luting cement, facilitating crown seating.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

141. A 60-year-old patient needs final impressions for a long-span FPD. He has gingival recession and mobile soft tissues.
Which impression material is most suitable?
(A) Irreversible hydrocolloid
(B) Polyether
(C) Alginate plus tray adhesive
(D) ZOE paste

142. A patient exhibits extensive saliva flow and slight gingival bleeding around a prepared molar abutment. The dentist must obtain a precise final impression for the FPD retainer. Retraction cord with hemostatic agent was placed, but fluid contamination persists.
Which method can help secure a dry field for detailed margin capture?
(A) Using a triple tray with no cord
(B) Rubber dam isolation over the abutment
(C) Electrosurgical tissue cauterization
(D) Localized tissue retraction with an injectable retraction paste and cordless technique

143. A patient's final impression for a maxillary FPD shows voids at the margins due to air entrapment. The lab cannot precisely fabricate the retainers.
Which immediate step should the dentist take?
(A) Use the same impression and request the lab patch it
(B) Re-impress with proper gingival retraction and air syringe control
(C) Request a partial veneer design from the lab
(D) Instruct the patient to use a fluoride mouthrinse

144. A 59-year-old patient has FPD abutments prepared for a 4-unit bridge in the mandible. After three unsuccessful final impressions with polyvinyl siloxane (PVS), each showing marginal distortion on the distal abutment, the dentist suspects the gingival tissue is collapsing quickly after retraction cord removal. The margins are subgingival, and controlling moisture is difficult.
Which modification could most effectively facilitate an accurate final impression?
(A) Single-cord technique repeated multiple times
(B) Splinting the temporary restoration to hold tissue away
(C) Using a two-cord technique and leaving the lower cord in place during the impression
(D) Minimizing the working time by switching to alginate

145. What is a "split-cast mounting" in crown and bridge procedures?
(A) Separating the final cast into multiple sections for easy inspection
(B) A technique of mounting the working cast on an articulator with a removable segment that preserves the relationship
(C) Sawing out individual dies from the main cast
(D) Using different plasters for different segments

146. Which cement is known for releasing fluoride and offering moderate strength in FPD cementation?
(A) Zinc phosphate cement
(B) Polycarboxylate cement
(C) Glass ionomer cement
(D) Resin-based cement

147. Why might a resin-modified glass ionomer (RMGIC) cement be preferred over a traditional glass ionomer for final cementation?
(A) It eliminates the need for tooth preparation
(B) It contains no fluoride
(C) It has improved early strength and lower solubility
(D) It cannot bond to tooth structure

148. All of the following factors favor successful FPD cementation EXCEPT:
(A) Thoroughly cleaned and dried abutment surfaces
(B) Sufficient film thickness of the cement
(C) Precise marginal adaptation of the retainer
(D) Excessively high humidity during cementation

149. While cementing a 3-unit FPD with resin-based cement, which step is crucial for maximizing bond strength?
(A) Placing the FPD immediately without tooth surface conditioning
(B) Using a self-etch primer or total-etch protocol on the abutment surfaces
(C) Skipping isolation to allow saliva flow
(D) Inverting the retainer for insertion from the lingual

150. Assertion (A): Final polishing and occlusal adjustments are necessary after FPD cementation.
Reason (R): Adjusting the prosthesis out of occlusion ensures that the patient cannot contact it functionally.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

151. Which statement best defines a dental implant in prosthodontics?
(A) A removable device that relies on retentive clasps
(B) A non-biologic titanium or ceramic fixture placed in the jawbone to support prostheses
(C) A partial denture framework using telescopic attachments
(D) A resin-bonded fixed bridge that utilizes wing retainers

152. What is the key biological process that allows implants to anchor firmly in bone?
(A) Fibrous encapsulation
(B) Osteointegration
(C) Epithelium-to-implant adhesion
(D) Collagen bridging

153. Why is titanium commonly chosen as a material for dental implants?
(A) It dissolves slowly, stimulating new bone growth
(B) It offers a high modulus of elasticity exactly matching natural bone
(C) It is biocompatible and promotes osseointegration
(D) It cannot scratch or wear under any conditions

154. All of the following are indications for dental implants EXCEPT:
(A) Replacing a single missing tooth when adjacent teeth are sound
(B) Providing support for an overdenture

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(C) Stabilizing a fixed full-arch prosthesis
(D) Managing large cystic lesions in the jaw

155. Compared to a two-stage implant procedure, an immediate (one-stage) implant approach:
(A) Omits the surgical placement of the fixture
(B) Always guarantees better osseointegration
(C) Often places a healing abutment or provisional crown at the initial surgery
(D) Is never used in the anterior esthetic zone

156. A patient wants a single implant for a missing maxillary lateral incisor. Which condition is critical for immediate implant placement and provisionalization?
(A) Minimal alveolar bone density
(B) Adequate initial implant stability (high torque)
(C) Defective alveolar ridge contour
(D) Persistent infection at the extraction site

157. You are planning an implant in the posterior mandible. The panoramic radiograph reveals the inferior alveolar canal is close to the site. Which planning step is essential?
(A) Selecting the widest implant possible
(B) Measuring a safety distance of at least 2 mm from the canal
(C) Placing the implant exactly flush with the canal's border
(D) Avoiding a surgical guide

158. During surgery, if you suspect the implant osteotomy is encroaching too closely on the inferior alveolar nerve, what is the best immediate action?
(A) Continue with the planned depth to ensure stability
(B) Remove the implant entirely and suture the site
(C) Change the angulation or shorten the osteotomy to maintain a safe distance
(D) Quickly place two narrow implants to distribute forces

159. In implant dentistry, which factor primarily determines immediate or early loading of an implant?
(A) The brand of implant used
(B) The patient's pain tolerance
(C) Achieved primary stability in the bone
(D) The color of the abutment

160. In placing a two-stage implant, the following steps are taken. Which is INCORRECT?
(A) Osteotomy preparation following the manufacturer's drill sequence
(B) Insertion of the implant below the alveolar crest level
(C) Placing a healing abutment immediately for final soft tissue contour
(D) Covering the implant with a cover screw and suturing tissues over it

161. Excessive micromotion of an implant during the early healing phase often leads to:
(A) Enhanced osseointegration
(B) Fibrous tissue encapsulation and potential implant failure
(C) Faster bone remodeling
(D) Overgrowth of keratinized gingiva around the implant

162. A 55-year-old patient undergoes implant placement in the posterior maxilla where the bone is relatively porous. Despite careful drilling and standard torque, the surgeon notes borderline primary stability. The dentist considers immediate loading but worries about micromotion.
Which approach best balances outcomes?
(A) Immediately place a final prosthesis to test occlusion
(B) Delay loading, allowing a standard healing period of 3–4 months
(C) Use no implant and switch to a removable partial denture
(D) Force the implant deeper than recommended to achieve higher torque

163. A 64-year-old patient complains of a dull ache and slight mobility around an implant that was placed 5 years ago. Radiographs show a vertical bony defect and mild suppuration. Which condition is most likely?
(A) Peri-implant mucositis
(B) Peri-implantitis
(C) Cement excess under the prosthesis
(D) Sinusitis unrelated to the implant

164. For a patient diagnosed with peri-implantitis and 3 mm of bone loss around the implant, which immediate management step is generally recommended?
(A) Explanting the implant immediately
(B) Non-surgical debridement plus local antimicrobial measures
(C) Placing a larger diameter implant around the existing fixture
(D) No intervention until bone loss exceeds 5 mm

165. According to standard implant guidelines, how much inter-implant distance is generally recommended to maintain healthy papilla and bone?
(A) 1 mm
(B) 3 mm
(C) 6 mm
(D) 0.5 mm

166. A newly placed implant demonstrates persistent dull pain and slightly mobile fixture at the 2-week follow-up. Which red flag issue should be ruled out?
(A) Overextended crown margin
(B) Incisal wear on adjacent teeth
(C) Poor osseointegration or early failure
(D) Mucosal thickening in the maxillary sinus

167. Which clinical sign suggests successful osseointegration during the uncovering (second stage) of a two-stage implant?
(A) Implant rotation when gently torqued
(B) Purulent discharge around the cover screw
(C) Firm stability with no mobility
(D) Bleeding from the implant apex

168. Assertion (A): A healing abutment is placed after implant uncovering to shape the peri-implant soft tissue.
Reason (R): The healing abutment preserves the correct occlusal vertical dimension.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

169. When an implant is in function with a final crown, how should occlusion generally be adjusted?
(A) No contact in centric and no contact in excursions
(B) Light contact in centric with slightly reduced contacts in excursions
(C) Heavier contact in centric to stimulate bone
(D) Same occlusal intensity as adjacent natural teeth

170. Which diagnostic tool is particularly helpful to evaluate implant-bone interface stability non-invasively?
(A) Pulp vitality testing
(B) Resonance frequency analysis (RFA)
(C) Facebow transfer
(D) Cone beam computed tomography (CBCT) for soft tissue

171. A 70-year-old patient's implant-supported crown appears too long and the gingival esthetics are compromised.
Which step can best improve soft tissue contours for a more natural emergence?
(A) Gingivoplasty
(B) Using a shorter implant abutment
(C) Pink porcelain to mask the discrepancy
(D) Connective tissue graft around the implant

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172. A patient's anterior implant crown exhibits a grayish discoloration at the gingival margin due to the metal abutment shining through thin tissue. The dentist wants to enhance esthetics.
Which modification would most effectively reduce this grayish hue?
(A) Switch to a polished metal healing collar
(B) Use a zirconia abutment
(C) Increase occlusal contact
(D) Trim away more tissue

173. An elderly patient requires two implants for a mandibular overdenture. The alveolar ridge is severely resorbed, offering minimal vertical height. Which attachment system often provides the simplest retention and stress distribution for such an overdenture?
(A) Locator attachments
(B) Magnet attachments
(C) Telescopic copings
(D) Ball/O-ring attachments

174. A 65-year-old patient complains that his implant-supported overdenture (on two mandibular implants with ball/O-ring attachments) feels loose after 12 months of use. Examination shows worn O-rings and slight food debris accumulation. The patient has not attended regular maintenance appointments.
What is the primary corrective action to restore retention and function?
(A) Re-torque the abutments only
(B) Replace the worn O-ring inserts and perform thorough cleaning
(C) Add more implants for better support
(D) Instruct the patient to use denture adhesive

175. What is "platform switching" in implant prosthodontics?
(A) Using the same diameter abutment as the implant platform
(B) Placing a smaller diameter abutment on a wider implant platform
(C) Switching from a titanium abutment to a ceramic one
(D) Changing implant designs mid-surgery

176. Which is the most common implant connection design in modern two-piece implants?
(A) External hex
(B) Internal hex or conical connection
(C) Blade vent design
(D) Transosteal staple

177. Why is an internal conical (Morse taper) implant-abutment connection considered advantageous?
(A) It simplifies abutment removal by providing zero friction
(B) It helps create a bacterial seal and distribute forces effectively
(C) It eliminates the need for occlusal clearance
(D) It uses a flexible silicone interface for retention

178. All of the following can lead to abutment screw loosening in an implant-supported crown EXCEPT:
(A) Inadequate torque application
(B) Excessive occlusal overload or lateral forces
(C) Implants placed with platform switching
(D) Poor fit of the prosthetic framework

179. When comparing screw-retained vs. cement-retained implant crowns, which statement is true?
(A) Cement-retained crowns always facilitate easy retrieval
(B) Screw-retained crowns often allow simpler retrieval and maintenance
(C) Cement-retained restorations pose no risk of excess cement
(D) Screw-retained crowns have superior esthetics in the anterior region

180. In designing an anterior implant crown, what technique can improve esthetics if a screw-retained approach is chosen?
(A) Angled screw channel technology
(B) Leaving the access hole on the facial surface
(C) Using black composite to fill the screw access
(D) Overtightening the abutment screw

181. A dentist receives a lab-fabricated implant crown with a slight gap between the abutment and crown margin. What is the best immediate approach?
(A) Cement the crown anyway; the gap will seal with saliva
(B) Return it to the lab for revision or remake
(C) Fill the gap with flowable composite
(D) Grind the implant abutment further in the mouth

182. During the digital impression procedure for an implant-supported crown, the following steps are taken. Which step is INCORRECT?
(A) Attaching a scan body (scan post) to the implant/abutment
(B) Capturing the occlusal relationships with an intraoral scanner
(C) Generating a virtual model for CAD/CAM design
(D) Using conventional polyether material to finalize the digital file

183. If a patient has poor oral hygiene and significant plaque accumulation around an implant, what is the likely outcome over time?
(A) Enhanced bone remodeling due to plaque stimulation
(B) Peri-implant inflammation, possibly leading to peri-implantitis
(C) Improved soft tissue seal
(D) Spontaneous plaque removal by sulcular fluid

184. A 70-year-old patient with an implant-supported bridge in the mandible has a 2-year history of inconsistent home care. Examination reveals inflamed tissues, 4 mm pockets, and bleeding on probing, but no radiographic bone loss.
Which condition and action are most appropriate?
(A) This is peri-implantitis, requiring immediate surgical intervention
(B) It is peri-implant mucositis; emphasize improved hygiene and non-surgical debridement
(C) The implants are failing; schedule removal
(D) Suggest a new fixed partial denture

185. Radiographic evaluation of a 5-year-old implant shows a crater-like bone defect around the implant threads and increased probing depths. Which specific pattern is commonly seen in peri-implantitis?
(A) A uniform horizontal bone resorption
(B) A vertical or "saucer-shaped" defect around the implant
(C) Mixed radiopaque-lucent lines in the alveolar bone
(D) Dense lamina dura formation near the implant collar

186. For moderate peri-implantitis (around 4–5 mm of bone loss) with a deep pocket, which management is typically recommended?
(A) Strictly brushing instructions without debridement
(B) Surgical approach, including flap debridement and possible regenerative procedures
(C) Extraction of the implant
(D) Applying fluoride varnish over the implant surface

187. Which practice is crucial for long-term success of an implant-supported prosthesis?
(A) Regular prophylaxis and assessment of peri-implant tissues
(B) Never removing the prosthesis for inspection
(C) Reducing follow-up visits to once every 5 years
(D) Only using antibiotic mouthwash indefinitely

188. You are fabricating an implant bar overdenture. The following steps are performed. Which is INCORRECT?
(A) Verifying passive fit of the metal bar on the implant abutments
(B) Checking adequate space for denture teeth and acrylic resin
(C) Blocking out undercuts so the bar can friction-lock the prosthesis forcibly
(D) Ensuring attachments (clips) seat fully on the bar

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189. A single implant crown experiences repeated porcelain fracture under normal function. Which factor is most likely the cause?
(A) Light occlusal contact on the implant
(B) Insufficient thickness or poor support of the porcelain veneer
(C) Adequate cusp reduction during abutment preparation
(D) Under-torqued abutment screw leading to mobility

190. According to commonly accepted guidelines, how much keratinized gingiva is desirable around an implant for optimal long-term health?
(A) None is necessary if the bone is stable
(B) Around 2 mm or more
(C) 8–10 mm
(D) Only a pocket depth under 5 mm matters

191. Assertion (A): A diagnostic wax-up and surgical guide are often used before implant placement.
Reason (R): These steps ensure the implant is placed in the best restorative position and angulation.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

192. A 58-year-old patient's implant abutment is slanted bucally due to angled implant placement. Which abutment choice can correct the prosthetic path of insertion?
(A) Stock abutment
(B) Custom angulated abutment
(C) Ball attachment
(D) One-piece implant with no abutment

193. A 60-year-old patient presents for implant placement in the upper first molar site. CBCT shows a pneumatized maxillary sinus with only 4 mm of bone height. The dentist plans a sinus augmentation. Which procedure best allows vertical bone gain for implant placement?
(A) Ridge split
(B) Internal sinus lift (osteotome technique)
(C) Guided bone regeneration with an onlay graft
(D) Connective tissue graft

194. A patient with diabetes (well-controlled HbA1c) seeks implant treatment for multiple missing teeth. The dentist is concerned about healing. Which statement regarding implant therapy in well-controlled diabetic patients is TRUE?
(A) Implants are absolutely contraindicated
(B) Healing is always severely compromised, leading to certain failure
(C) With stable glycemic control, success rates approach those of non-diabetics
(D) Antibiotics are never used

195. All of the following factors can affect implant stability EXCEPT:
(A) Bone density at the implant site
(B) Implant design and surface treatment
(C) The prosthetic material used for the final crown
(D) The surgical technique (speed, cooling, torque)

196. Compared to a standard endosseous implant, a zygomatic implant is:
(A) Placed into alveolar bone of the maxilla
(B) Shorter in length for minimal sinus involvement
(C) Anchored in the zygoma to rehabilitate severely resorbed maxillas
(D) Exclusively for mandibular reconstruction

197. A patient with a history of heavy smoking wants multiple implants. Which factor should be addressed to improve implant success?
(A) Smoking cessation or reduction prior to and after surgery

(B) Switching to an overdenture, as implants cannot succeed in smokers
(C) Using only mini-implants to reduce surgical trauma
(D) Delaying any intervention for at least 5 years

198. In a full-arch implant rehabilitation, the dentist opts for an "All-on-4" concept. Which key characteristic defines this approach?
(A) Four implants placed uniformly upright in the maxilla
(B) Two vertical anterior implants and two tilted posterior implants
(C) Using short implants only for the entire arch
(D) Cementing a porcelain-fused-to-metal bridge on four standard abutments

199. When fabricating an immediate loading full-arch provisional on "All-on-4" implants, what feature is critical?
(A) Heavy occlusal contacts in all excursive movements
(B) Rigid splinting of the implants via the prosthesis
(C) No contact in centric occlusion
(D) Use of metal clasps for retention

200. Assertion (A): Regular peri-implant maintenance visits are essential even for asymptomatic patients. Reason (R): Early detection of plaque accumulation or tissue changes can prevent progression to peri-implantitis.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false
(D) A is false, but R is true

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CHAPTER 10

ORAL MEDICINE

1. Which of the following statements best defines Oral Medicine as a specialty within dentistry?
   (A) It deals only with developing prosthetic solutions for missing teeth
   (B) It focuses primarily on cosmetic enhancements of the oral region
   (C) It is concerned with the diagnosis and medical management of complex orofacial disorders
   (D) It emphasizes solely on specialized endodontic interventions

2. Which pioneer is widely recognized for shaping the modern scope of Oral Medicine through systematic research and clinical training programs?
   (A) Dr. Charles Goodnight
   (B) Dr. Louis Blum
   (C) Dr. Lester Burket
   (D) Dr. Harold Fearn

3. In the practice of Oral Medicine, which key factor best justifies the need for collaborative patient care involving medical specialists?
   (A) High prevalence of purely aesthetic concerns
   (B) Exclusive dental origin of most oral lesions
   (C) Frequent association between oral findings and systemic disorders
   (D) Limited scope of diagnostic tools in dentistry

4. Which of the following is NOT a common function of an Oral Medicine specialist?
   (A) Managing immunologically mediated oral disorders
   (B) Prescribing medication for oral mucosal lesions
   (C) Conducting major reconstructive surgeries of the jaw
   (D) Coordinating care for patients with systemic diseases and oral manifestations

5. How does the diagnostic approach in Oral Medicine differ from that in a purely surgical dental field?
   (A) Oral Medicine focuses on medication-based therapies, while surgical fields rely almost exclusively on extractions
   (B) Oral Medicine places greater emphasis on systemic evaluation, whereas surgical fields highlight procedural interventions
   (C) Oral Medicine rarely uses advanced imaging, but surgical fields are heavily dependent on radiographs
   (D) Oral Medicine completely disregards local oral factors, but surgical fields consider them thoroughly

6. Which aspect of patient care is often central in an Oral Medicine clinic's approach to complex oral lesions?
   (A) Emphasis on cosmetic interventions
   (B) Relying solely on patient self-reports for diagnosis
   (C) Integration of medical history and laboratory investigations
   (D) Immediate extraction of suspicious teeth

7. A 40-year-old patient presents with multiple, bilateral, non-scrapable white lesions on the buccal mucosa. In Oral Medicine, what should be the next step?
   (A) Immediate surgical excision of all lesions
   (B) Prescribe antifungal therapy without further tests
   (C) Obtain a thorough medical history, perform a biopsy, and consider systemic factors
   (D) Recommend only routine oral hygiene measures

8. An Oral Medicine specialist suspects mucous membrane pemphigoid in an elderly patient. What is the most appropriate immediate management plan?
   (A) Prescribe antibiotics for seven days
   (B) Initiate topical or systemic corticosteroids and consult with a physician for systemic evaluation
   (C) Refer for radical surgical intervention
   (D) Provide no treatment unless major tissue loss occurs

9. When introducing a new patient to an Oral Medicine consultation, which step is most pivotal in establishing a comprehensive treatment plan?
   (A) Reviewing the patient's dental radiographs only
   (B) Focusing solely on identifying any missing teeth
   (C) Thoroughly evaluating the patient's medical history, medications, and systemic status
   (D) Ensuring minimal physician collaboration to maintain privacy

10. Which action would be inappropriate for an Oral Medicine specialist assessing an immunocompromised patient with unexplained oral ulcerations?
   (A) Conduct a detailed hematologic workup
   (B) Obtain viral cultures or PCR testing for suspected infections
   (C) Prescribe broad-spectrum antibiotics without identifying causative factors
   (D) Evaluate nutritional status and vitamin deficiencies

11. Which systemic condition is most commonly associated with the classic triad of oral candidiasis, xerostomia, and bilateral parotid enlargement?
   (A) Diabetes mellitus
   (B) HIV infection
   (C) Sjögren's syndrome
   (D) Chronic renal failure

12. Why is it critical to monitor oral findings in patients with poorly controlled diabetes?
   (A) Oral lesions are rarely influenced by blood sugar levels
   (B) Periodontal disease and delayed wound healing are possible indicators of poor glycemic control
   (C) Insulin therapy has no impact on the oral mucosa
   (D) Diabetes usually spares oral tissues from complications

13. Which of these oral manifestations is NOT typically linked to chronic renal failure?
   (A) Ammonia-like odor of the breath
   (B) Uremic stomatitis
   (C) Excessive calculus formation due to altered salivary pH
   (D) Diffuse melanoma-like pigmentation of the gingiva

14. Assertion: Patients with hyperthyroidism may present with increased dental caries and periodontal disease.
   Reason: Excessive thyroid hormone enhances metabolic rates, potentially altering inflammatory responses and oral microflora ecology.
   (A) Both Assertion and Reason are true, and the Reason is the correct explanation for the Assertion
   (B) Both Assertion and Reason are true, but the Reason is not the correct explanation for the Assertion
   (C) Assertion is true, but Reason is false
   (D) Assertion is false, but Reason is true

15. A 55-year-old patient with poorly controlled hypertension reports spontaneous gingival bleeding and severe halitosis. Blood tests reveal prolonged bleeding time. Which systemic factor is most likely implicated?
   (A) Anticoagulant medications
   (B) Vitamin C deficiency
   (C) Leukemic infiltration
   (D) Liver cirrhosis

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16. In a patient with rheumatoid arthritis experiencing TMJ stiffness and oral ulcers, which interprofessional collaboration is most beneficial for holistic care?
(A) Partnership with a dermatologist only
(B) Consultation with a rheumatologist for systemic management
(C) Exclusive referral to a surgeon for joint replacement
(D) No interprofessional collaboration is needed

17. How does systemic lupus erythematosus (SLE) frequently manifest in the oral cavity?
(A) Necrotizing ulcerative gingivitis
(B) Keratotic white plaques resembling leukoplakia
(C) Painful oral ulcers with erythematous halo
(D) Extensive alveolar bone loss without inflammation

18. High-dose corticosteroid therapy in organ transplant patients often leads to which oral manifestation?
(A) Oral tuberculosis
(B) Reactive fibrous hyperplasia
(C) Cushingoid oral pigmentations
(D) Candidal overgrowth

19. Which oral manifestation is frequently associated with celiac disease?
(A) Bluish discoloration of the tongue
(B) Multiple aphthous-like ulcers
(C) Excessive tooth mobility
(D) Oral papillomas in the palate

20. For a patient suspected of having Addison's disease who presents with diffuse oral pigmentation, which diagnostic test is most appropriate?
(A) Fasting blood glucose test
(B) Liver function test
(C) Serum cortisol and ACTH stimulation test
(D) Thyroid function test

21. A 38-year-old female complains of burning mouth sensation, generalized weakness, and brittle nails. Intraoral examination reveals atrophic glossitis with a smooth, reddened tongue surface. She denies significant medical history but follows a strict vegan diet. Which deficiency is most likely responsible for these oral findings?
(A) Vitamin C deficiency
(B) Vitamin B12 deficiency
(C) Iron deficiency
(D) Zinc deficiency

22. A 50-year-old male with chronic hepatitis B is referred for evaluation of multiple, persistent oral ulcers and generalized gingival bleeding. Examination reveals pallor and petechiae. Laboratory findings show thrombocytopenia and elevated PT. Which underlying condition is most probable?
(A) Immune thrombocytopenic purpura
(B) Acute lymphocytic leukemia
(C) Chronic liver disease–related coagulopathy
(D) Aplastic anemia

23. In a patient with long-standing Crohn's disease, which oral finding should prompt an immediate reassessment for complications or disease flare-ups?
(A) Bilateral linea alba on the buccal mucosa
(B) Diffuse melanin pigmentation along the gingival margin
(C) Cobblestone appearance of the buccal mucosa with ulcerations
(D) Slight dryness of the lips without ulceration

24. Macroglossia, scalloped tongue borders, and difficulty swallowing in an older adult may suggest which systemic disease?
(A) Rheumatic fever
(B) Acromegaly
(C) Hypothyroidism
(D) Tuberculosis

25. Which key oral manifestation differentiates pernicious anemia from iron deficiency anemia?
(A) Pale mucosa
(B) Burning sensation of the tongue

(C) Koilonychia (spoon-shaped nails)
(D) Lemon-yellow mucosal tint

26. A diabetic patient complains of frequent oral thrush and angular cheilitis. His blood glucose levels are consistently above target. Which immediate measure should be emphasized to reduce these recurrent fungal infections?
(A) Restrict water intake to prevent fungal spread
(B) Improve glycemic control through medication and diet
(C) Use of high-concentration fluoride mouthwash
(D) Perform daily vigorous tooth brushing without addressing hyperglycemia

27. Prolonged use of phenytoin for seizure control can lead to which significant oral manifestation?
(A) TMJ arthralgia
(B) Diffuse alveolar bone resorption
(C) Gingival hyperplasia
(D) Mucous membrane pemphigoid

28. Which autoimmune condition involves circulating autoantibodies against desmoglein proteins, leading to suprabasal acantholysis and oral blisters?
(A) Bullous pemphigoid
(B) Pemphigus vulgaris
(C) Erythema multiforme
(D) Lichen planus

29. A patient with systemic sclerosis presents with microstomia, thickened oral tissues, and limited mouth opening. What dental management strategy is crucial in this scenario?
(A) Monthly professional bleaching
(B) Frequent surgical biopsies of the oral mucosa
(C) Fabrication of mouth-opening devices and physical therapy exercises
(D) Immediate extraction of all posterior teeth

30. Oral manifestations like bullae formation and repeated bleeding during brushing in a middle-aged patient can raise suspicion for which hematologic condition?
(A) Hemophilia A
(B) von Willebrand disease
(C) Thalassemia minor
(D) Idiopathic thrombocytopenic purpura (ITP)

31. A 60-year-old smoker with COPD and chronic steroid use presents with erythematous palatal lesions and persistent mucosal friability. Which opportunistic infection is most likely?
(A) Histoplasmosis
(B) Oral candidiasis
(C) Cytomegalovirus stomatitis
(D) Actinomycosis

32. A 45-year-old male with chronic myeloid leukemia (CML) complains of persistent gingival enlargements and multiple petechiae on the hard palate. He is on targeted tyrosine kinase inhibitor therapy. Laboratory tests show fluctuating white cell counts. Which factor primarily contributes to these oral findings in CML?
(A) Direct infiltration by leukemic cells
(B) Hypersensitivity to toothpaste ingredients
(C) Excessive flossing trauma
(D) Mucosal dryness from medication

33. Assertion: Oral manifestations in systemic diseases often appear before other clinical signs become evident.
Reason: The oral cavity has a high turnover rate and rich vascular supply, enabling early expression of systemic pathology.
(A) Both Assertion and Reason are true, and the Reason is the correct explanation for the Assertion
(B) Both Assertion and Reason are true, but the Reason is not the correct explanation for the Assertion
(C) Assertion is true, but Reason is false
(D) Assertion is false, but Reason is true

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34. Why is it essential for an Oral Medicine specialist to be aware of a patient's medication history in conditions like cardiovascular disease and psychiatric disorders?
(A) Most drugs have no oral adverse effects
(B) Drug interactions rarely affect oral tissues
(C) Medications can induce xerostomia, gingival hyperplasia, or taste alterations
(D) Medication history is only relevant for surgery scheduling

35. When evaluating a patient with suspected sarcoidosis and multiple oral granulomatous lesions, which action would NOT be appropriate?
(A) Ordering serum ACE levels
(B) Performing a biopsy of the lesion for histopathological confirmation
(C) Initiating systemic corticosteroid therapy without a confirmed diagnosis
(D) Requesting chest radiography to check for pulmonary involvement

36. In a patient with significant oral lichen planus and uncontrolled hypertension, which systemic therapy must be approached cautiously?
(A) Systemic corticosteroids
(B) Topical anesthetic mouthwash
(C) Chlorhexidine rinse
(D) Antifungal lozenges

37. Why might recurrent aphthous ulcers be more common in patients with inflammatory bowel disease (IBD)?
(A) IBD patients typically brush their teeth too vigorously
(B) Autoimmune pathways contributing to intestinal inflammation can also trigger oral mucosal ulceration
(C) Aphthous ulcers are a direct result of antibiotic overuse
(D) Nutritional deficiencies due to chronic diarrhea are irrelevant

38. A 58-year-old undergoing chemotherapy for leukemia develops painful oral mucositis and pseudomembranous patches. Which immediate approach is most critical for her oral lesions?
(A) Systemic antibiotics
(B) Antifungal therapy and supportive mouth rinses
(C) High-dose corticosteroids
(D) Continuous saline irrigation alone

39. How does Sjögren's syndrome commonly affect the oral cavity?
(A) Hypersalivation and drooling
(B) Excessive plaque accumulation
(C) Xerostomia leading to increased caries risk
(D) Painful vesiculobullous lesions

40. Which symptom or sign is LEAST likely in a patient with end-stage renal disease presenting with oral complications?
(A) Metallic taste or dysgeusia
(B) Uremic odor on the breath
(C) Increased frequency of aphthous ulcers
(D) Excessive saliva production

41. In patients with leukemia and severe neutropenia, which preventive oral care measure is most recommended to reduce infection risk?
(A) Daily chlorhexidine mouth rinse
(B) Abrasive whitening toothpaste
(C) Intermittent antibiotic mouthwash used monthly
(D) High-dose steroids for prophylaxis

42. A 35-year-old with uncontrolled Type 1 diabetes exhibits severe periodontitis and multiple abscesses. What essential approach should an Oral Medicine specialist advocate to improve oral outcomes?
(A) Immediate full-mouth extractions
(B) Isolated treatment of periodontal pockets without systemic interventions
(C) Joint medical consultation for optimizing glycemic control
(D) Exclusive use of antimicrobial mouth rinses

43. For a patient with thalassemia major requiring frequent blood transfusions, which oral sign indicates possible iron overload or hemochromatosis-like state?
(A) Bright red lips
(B) Diffuse blue-gray discoloration of the mucosa
(C) Persistent necrotizing ulcerative gingivitis
(D) Significant alveolar bone loss around molars

44. When managing an immunocompromised patient undergoing chemotherapy who presents with severe oral mucositis, which protocol is generally recommended by oncology and Oral Medicine guidelines?
(A) Completely abstain from oral care to avoid tissue trauma
(B) Use bland rinses, topical anesthetics, and cryotherapy during chemotherapy infusion
(C) Immediate discontinuation of chemotherapy until oral lesions resolve fully
(D) Administer broad-spectrum antibiotics prophylactically for all patients

45. Which oral manifestation would prompt an Oral Medicine specialist to investigate underlying gastrointestinal disease like ulcerative colitis?
(A) Multifocal white spots that disappear on wiping
(B) Chronic, nonspecific halitosis
(C) Recurrent pyostomatitis vegetans with pustular lesions
(D) Black hairy tongue

46. A middle-aged patient with Raynaud's phenomenon, sclerodactyly, and severe xerostomia should be screened for which multisystem disease that can show oral involvement?
(A) Systemic lupus erythematosus
(B) Scleroderma (systemic sclerosis)
(C) Rheumatoid arthritis
(D) Pemphigus foliaceus

47. In patients with chronic obstructive pulmonary disease (COPD) who use inhaled steroids, why might thrush be a frequent occurrence?
(A) Inhaled steroids harbor special fungal spores
(B) Oral mucosa becomes numb and prone to mechanical trauma
(C) Local immunosuppression in the oropharynx facilitates fungal overgrowth
(D) Steroids cause excessive salivary flow that washes away protective factors

48. A 70-year-old with uncontrolled diabetes presents with multiple black necrotic lesions on the hard palate and turbinate area. Which life-threatening infection should be suspected immediately?
(A) Mucormycosis
(B) Oral tuberculosis
(C) Actinomycosis
(D) Necrotizing ulcerative gingivitis

49. In a patient with advanced liver cirrhosis and coagulopathy requiring dental extractions, which guideline-based approach is advised for managing potential bleeding risks?
(A) Proceed with extractions without lab assessments
(B) No local measures are needed as cirrhosis does not affect bleeding
(C) Use local hemostatic agents and coordinate with a hematologist for possible correction of clotting factors
(D) Stop all medications abruptly before the procedure

50. Which of the following is NOT a recognized oral manifestation in patients with gastrointestinal reflux disease (GERD)?
(A) Dental erosion on palatal surfaces of maxillary teeth
(B) Persistent sore throat or throat clearing
(C) Excessive calculus buildup
(D) Burning sensation in the oropharynx

51. What is the fundamental definition of a temporomandibular joint (TMJ) disorder?
(A) Any acute jaw dislocation from direct trauma
(B) A pathological condition involving the TMJ disc alone
(C) A collective term for functional and structural abnormalities affecting the TMJ and associated structures

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(D) Exclusively an acute infection of the condyle region

52. Which component primarily serves as the articular surface cushioning the mandibular condyle and the temporal bone?
(A) Articular eminence
(B) Synovial fluid
(C) Articular disc
(D) Retrodiscal pad

53. Why might parafunctional habits like bruxism exacerbate TMD symptoms?
(A) They reduce synovial fluid within the joint capsule
(B) They create excessive stress on the TMJ and masticatory muscles
(C) They stimulate nerve regeneration, causing more pain
(D) They primarily affect only the maxillary sinus, unrelated to TMJ

54. Which of the following is NOT typically included in non-surgical management of TMD?
(A) Occlusal splint therapy
(B) Physical therapy and muscle exercises
(C) Psychologic counseling to address stress factors
(D) Immediate open joint surgery for first-line treatment

55. How does anterior disc displacement with reduction differ from anterior disc displacement without reduction?
(A) With reduction, joint infection is mandatory; without reduction, infection is absent
(B) With reduction, the disc relocates during jaw opening; without reduction, the disc remains displaced, limiting range of motion
(C) With reduction, the disc is permanently dislocated; without reduction, the condyle is severely damaged
(D) With reduction, the retrodiscal tissue is always calcified; without reduction, it remains normal

56. Which clinical sign often indicates a TMJ anterior disc displacement with reduction?
(A) Crepitus on opening
(B) Audible click or pop during jaw movement
(C) Parasthesia of the lower lip
(D) Inability to open beyond 10 mm

57. A 30-year-old patient presents with morning jaw pain, limited opening, and a chronic habit of grinding at night. Which initial intervention is typically recommended?
(A) Immediate TMJ surgery
(B) Fabrication of a stabilization splint
(C) Complete replacement of all posterior restorations
(D) Prescribe high-dose antibiotics

58. A patient with TMD experiences severe discomfort and muscle spasms. After confirming no acute joint pathology, which conservative measure is often the best next step?
(A) Occlusal equilibration immediately
(B) Arthrotomy under general anesthesia
(C) Jaw exercises and physical therapy
(D) Intravenous sedation for regular deep cleaning

59. In managing an acute TMJ dislocation, which step would be considered inappropriate?
(A) Attempting manual reduction under appropriate analgesia
(B) Prescribing muscle relaxants to alleviate spasm
(C) Applying jaw exercises once reduced
(D) Delaying treatment for weeks to “see if it settles on its own”

60. Which condition is least likely to contribute to TMD development?
(A) Rheumatoid arthritis
(B) Fibromyalgia
(C) Hormonal imbalances
(D) Gallbladder disease

61. Arthrocentesis of the TMJ differs from arthroscopy primarily in which respect?
(A) Arthrocentesis is an open surgical procedure; arthroscopy is non-invasive
(B) Arthrocentesis is minimally invasive fluid lavage; arthroscopy utilizes an endoscope for direct visualization
(C) Arthroscopy is only used to remove large tumors; arthrocentesis is exclusively for disc repositioning
(D) Arthrocentesis cannot relieve adhesions; arthroscopy can't irrigate the joint space

62. Which statement best describes the role of psychosocial factors in TMD?
(A) They have no influence on TMD pain severity
(B) Stress, anxiety, and depression can exacerbate muscle tension and perceived pain
(C) Only anatomic anomalies cause TMD
(D) Psychosocial factors can cure TMD without any medical intervention

63. A TMD patient demonstrates mild disc displacement but significant myofascial pain. Which therapy combination is generally favored?
(A) Large occlusal adjustments and open-joint surgery
(B) Muscle relaxants, physical therapy, and stress management
(C) Immediate advanced imaging and maxillary resection
(D) NSAIDs only, without further intervention

64. A 35-year-old complains of joint clicking and mild pain. MRI confirms a minor anterior disc displacement with reduction. What is the most likely recommended initial treatment plan?
(A) Arthrotomy
(B) Stabilization splint and home exercises
(C) Extraction of posterior teeth
(D) Steroid injections

65. A 45-year-old teacher with chronic stress describes persistent TMJ pain, intermittent clicking, and limited opening. She reports heavy nighttime clenching and uses NSAIDs frequently. Examination reveals tender masticatory muscles. What would be the most logical initial management?
(A) High-dose benzodiazepines
(B) Referral for arthroscopic surgery
(C) Occlusal splint plus targeted physiotherapy
(D) Full mouth rehabilitation

66. What defines trigeminal neuralgia among craniofacial pain conditions?
(A) A dull, continuous ache involving the maxillary sinus
(B) Sudden, severe, electric-shock-like episodes of facial pain
(C) Bilateral, throbbing headache across the forehead
(D) Chronic earache radiating into the neck

67. Which branch of the trigeminal nerve is most often implicated in trigeminal neuralgia?
(A) Ophthalmic (V1)
(B) Maxillary (V2)
(C) Mandibular (V3)
(D) Cervical (C2)

68. In typical trigeminal neuralgia, why are short bursts of high-intensity pain more common than prolonged aches?
(A) Continuous aches stem from peripheral nerve damage
(B) The disease predominantly involves demyelination in trigeminal sensory roots, causing hyperexcitable neuronal firing
(C) It is solely due to psychological overlay rather than actual nerve pathology
(D) There are no known anatomical or physiological changes behind this pattern

69. Which clinical scenario is NOT typically consistent with trigeminal neuralgia?
(A) Pain triggered by lightly touching the upper lip

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(B) Sudden sharp jolt localized to one side of the face
(C) Ongoing bilateral tension-like headache for several hours
(D) Intense facial pain episodes prompted by chewing

70. How does atypical facial pain differ from classic trigeminal neuralgia?
(A) Atypical facial pain never crosses midline
(B) Atypical facial pain is typically dull, continuous, and poorly localized rather than sharp, intermittent
(C) Both present equally with electric-shock-like pains
(D) Classic trigeminal neuralgia is always bilateral

71. A patient describes electric-like jolts in the maxillary area triggered by brushing. Which first-line medication is often prescribed for trigeminal neuralgia?
(A) Carbamazepine
(B) Ibuprofen
(C) Amitriptyline
(D) Ketoconazole

72. A patient on carbamazepine for trigeminal neuralgia continues to have frequent attacks. What is the next reasonable approach?
(A) Increase carbamazepine dose or add adjunct anticonvulsant
(B) Stop carbamazepine abruptly and switch to antibiotics
(C) Mandate arthroscopic TMJ examination
(D) Immediate excision biopsy of the trigeminal ganglion

73. Which clinical characteristic most strongly suggests a neuralgic rather than muscular origin of facial pain?
(A) Pain aggravated by palpation of the masseter muscle
(B) Pain triggered by gentle touch over a specific trigger zone
(C) Diffuse bilateral tension in the temporalis region
(D) Relief solely after prolonged muscle stretch

74. Which management option is LEAST recommended for persistent trigeminal neuralgia unresponsive to medical therapy?
(A) Microvascular decompression
(B) Glycerol rhizolysis
(C) Alcohol nerve block
(D) High-dose antibiotics regimen

75. Which statement differentiates cluster headache from trigeminal neuralgia?
(A) Cluster headache usually presents with unilateral periorbital pain and autonomic symptoms
(B) Both are always bilateral disorders
(C) Trigeminal neuralgia is linked to a cyclical pattern of attacks around the same time daily
(D) Cluster headache commonly involves sharp, electric-like pain triggered by chewing

76. Which artery is most commonly implicated in vascular compression leading to classic trigeminal neuralgia?
(A) External carotid artery
(B) Superior cerebellar artery
(C) Middle meningeal artery
(D) Posterior inferior cerebellar artery

77. Assertion: Inferior alveolar nerve involvement can mimic odontogenic pain.
Reason: Dental examinations can fail to distinguish nerve-driven pain from true dental pathology if thorough radiographic analysis is not performed.
(A) Both Assertion and Reason are true, and the Reason is the correct explanation for the Assertion
(B) Both Assertion and Reason are true, but the Reason is not the correct explanation for the Assertion
(C) Assertion is true, but Reason is false
(D) Assertion is false, but Reason is true

78. A 55-year-old patient complains of stabbing facial pain triggered by shaving and talking. Neurological exam is normal except for these brief, sharp episodes in the maxillary region. He fears daily activities. MRI shows no tumor. Which initial management is most appropriate?
(A) NSAIDs
(B) High-dose steroids
(C) Carbamazepine
(D) Antibiotic therapy

79. In craniofacial pain syndromes related to neuropathic origins, which multidisciplinary collaboration is most beneficial?
(A) Exclusive referral to a cardiologist
(B) Collaborative care between neurology, oral medicine, and pain specialists
(C) Referral to a dermatologist for facial lesions
(D) Dental prophylaxis alone

80. Persistent facial numbness and neuropathic pain in a patient with known malignancy history should prompt which immediate consideration?
(A) Possible metastatic infiltration of trigeminal nerve
(B) Routine TMD
(C) Sinusitis-induced pressure
(D) Migraine headache

81. Which statement accurately defines sialadenitis?
(A) A malignant tumor of the salivary gland
(B) An inflammatory condition of the salivary gland
(C) Complete calcification of the salivary duct system
(D) Excessive salivary flow at night

82. Which major salivary gland is most commonly affected by sialolithiasis (stone formation)?
(A) Sublingual gland
(B) Parotid gland
(C) Submandibular gland
(D) Minor labial glands

83. Why does inadequate fluid intake predispose individuals to sialadenitis?
(A) It promotes hypertrophy of the salivary ducts
(B) It concentrates saliva, facilitating bacterial growth and stone formation
(C) It leads to overproduction of antimicrobial factors
(D) It results in immediate atrophy of glandular tissue

84. Which of the following is NOT a typical clinical presentation of acute bacterial parotitis?
(A) Painful swelling in the region of the parotid gland
(B) Purulent discharge from Stensen's duct
(C) Fever and malaise
(D) Bilateral, painless swelling with no systemic symptoms

85. What differentiates Sjögren's syndrome–related salivary gland dysfunction from acute sialadenitis?
(A) Both are abrupt infections
(B) Sjögren's syndrome is an autoimmune process causing chronic dryness, while acute sialadenitis is typically an infectious/inflammatory event
(C) Sjögren's syndrome resolves spontaneously within 48 hours
(D) Acute sialadenitis never involves pain or swelling

86. When evaluating recurrent salivary gland swelling associated with meals, which diagnostic imaging is typically first-line?
(A) Panoramic radiograph
(B) High-resolution ultrasound
(C) MRI with contrast
(D) Plain chest X-ray

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87. A 40-year-old presents with a palpable swelling under the tongue, especially before meals, and pain that subsides after eating. Ultrasound reveals a small stone in Wharton's duct. What is the likely treatment?
(A) Conservative management with glandular massage and hydration; possibly ductal stone removal if accessible
(B) Immediate total submandibular gland excision
(C) Antibiotics for two months regardless of signs
(D) Biopsy for suspected malignancy

88. A patient with Sjögren's syndrome experiences persistent dry mouth impacting daily life. Which immediate measure is often recommended to alleviate symptoms?
(A) Immediate parotidectomy
(B) Use of artificial salivary substitutes and sialogogues
(C) High-dose antibiotics
(D) Extraction of all posterior teeth

89. Which clinical feature most strongly suggests an acute bacterial infection rather than a sialolith blockage alone in the parotid gland?
(A) Pre-meal swelling
(B) Facial nerve weakness and purulent discharge
(C) Intermittent swelling resolving spontaneously
(D) A solitary round opacity on ultrasound

90. Which of the following is NOT generally recommended in managing acute bacterial sialadenitis?
(A) Antibiotics targeting common oral flora
(B) Warm compresses and gland massage
(C) Adequate hydration and sialogogue use
(D) Complete gland excision immediately in all cases

91. What is the primary goal of imaging in Oral Medicine?
(A) Provide aesthetic guidance for cosmetic procedures
(B) Identify and characterize pathological conditions in the craniofacial region
(C) Replace the need for clinical examination
(D) Prevent use of any invasive diagnostic tools

92. Which imaging modality provides a three-dimensional view of dental and maxillofacial structures while using relatively lower radiation than conventional CT?
(A) Lateral cephalogram
(B) Panoramic radiograph
(C) Cone beam computed tomography (CBCT)
(D) Ultrasonography

93. Why might MRI be chosen over CT to evaluate soft tissue lesions in the oral cavity?
(A) MRI is generally cheaper than CT scans
(B) MRI offers superior soft tissue contrast without ionizing radiation
(C) CT has minimal value in evaluating salivary glands
(D) MRI is the only modality that can detect dental caries

94. Which is NOT a recognized indication for cone beam computed tomography (CBCT) in oral and maxillofacial diagnosis?
(A) Detailed assessment of impacted third molars and surgical planning
(B) Evaluation of periapical pathology and endodontic complexities
(C) Early detection of mucosal color changes
(D) Implant site evaluation and bone volume measurement

95. How do panoramic radiographs differ from periapical radiographs in their diagnostic utility?
(A) Panoramic captures an entire jaw overview, while periapical focuses on one or a few teeth in detail
(B) Periapical provides a broad view, while panoramic is limited to the front teeth only
(C) Panoramic cannot detect any pathology, whereas periapical detects all lesions
(D) Periapical imaging is typically used only for children

96. In the workup of suspected osteomyelitis of the mandible, which imaging technique is often deemed most sensitive for early bone marrow changes?
(A) Panoramic radiograph
(B) MRI
(C) Cephalometric radiograph
(D) Sialography

97. A patient has vague jaw pain and normal 2D radiographs. Which advanced modality would best evaluate possible small cystic lesions in the posterior mandible with minimal radiation?
(A) Medical CT scan
(B) Cone beam computed tomography (CBCT)
(C) MRI
(D) Radionuclide bone scan

98. In an MRI study of suspected TMJ disc displacement, which approach would be inappropriate?
(A) Using a surface coil for higher resolution
(B) Acquiring both open-mouth and closed-mouth views
(C) Employing T1- and T2-weighted images to assess soft tissues
(D) Administering high-dose iodinated contrast agent intravenously

99. For diagnosing salivary gland tumors, which imaging protocol is typically advocated by Oral Medicine guidelines for detailed soft tissue delineation?
(A) Ultrasound alone without further imaging
(B) MRI with contrast to evaluate tumor extent and relationship to adjacent structures
(C) Plain skull X-ray series
(D) Panoramic radiograph with bitewings

100. A 52-year-old patient presents with a two-month history of progressive, painless swelling near the angle of the jaw. Clinical exam suggests a parotid origin. Facial nerve function is intact. Ultrasound reveals a well-defined lesion. To better assess deep lobe involvement and potential extension into the parapharyngeal space, the oral physician requests an advanced imaging study. Which modality would provide the most comprehensive soft tissue detail for surgical planning?
(A) Cone beam CT
(B) MRI with contrast
(C) Panoramic radiograph
(D) Technetium-99m bone scan

101. In the context of dental practice, what does "medically compromised patient" primarily refer to?
(A) A patient with purely aesthetic dental concerns
(B) A patient with systemic health issues affecting treatment planning
(C) A pediatric patient lacking any medical history
(D) A patient needing only specialized implants

102. Which condition is most likely to require antibiotic prophylaxis before certain dental procedures according to standard guidelines?
(A) Uncontrolled epilepsy
(B) Chronic kidney disease stage 2
(C) A history of infective endocarditis
(D) Controlled asthma

103. Why must dentists evaluate a patient's International Normalized Ratio (INR) before performing invasive procedures on those taking warfarin?
(A) INR determines nutritional status only
(B) It measures thyroid hormone levels, crucial in healing
(C) It indicates the degree of anticoagulation, guiding bleeding risk management
(D) INR assessment is always irrelevant unless there's active infection

104. In managing a hypertensive patient in the dental clinic, which approach is NOT typically recommended?
(A) Scheduling shorter morning appointments
(B) Using stress-reduction protocols to minimize anxiety

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(C) Administering high concentrations of epinephrine indiscriminately
(D) Monitoring blood pressure before and after procedures

105. How does asthma differ from COPD when considering dental treatment modifications?
(A) COPD patients may have difficulty reclining for long, while asthmatics need acute bronchospasm prevention
(B) Asthmatics require no stress management; COPD patients do
(C) COPD always involves childhood onset, whereas asthma starts in adulthood
(D) Both conditions are identical in clinical manifestation and sedation requirements

106. In a diabetic patient presenting for dental treatment, which measure is typically emphasized to prevent intraoperative complications?
(A) Advising a complete fast for 24 hours before treatment
(B) Scheduling at the end of the day
(C) Checking blood glucose levels and ensuring the patient has taken medications and a meal
(D) Avoiding any local anesthetic with vasoconstrictor

107. A 67-year-old patient with controlled Type 2 diabetes arrives for a root canal. She took her morning insulin and had breakfast. Her pre-treatment blood glucose reads 95 mg/dL. What is the next step?
(A) Proceed as planned with treatment, monitoring for any hypoglycemic symptoms
(B) Cancel the appointment immediately
(C) Provide a large glucose load even though values are normal
(D) Double her insulin dose before anesthesia

108. A patient on long-term corticosteroid therapy for rheumatoid arthritis presents for tooth extraction. Which precaution is generally recommended to avoid adrenal insufficiency?
(A) Abruptly stop steroids two weeks before extraction
(B) Consider steroid dose augmentation or "stress dose" per physician advice
(C) Withhold local anesthesia entirely
(D) Perform no procedure unless vital signs remain high

109. In preparing to treat a patient who has undergone solid organ transplantation (e.g., kidney transplant), which action would be inappropriate?
(A) Reviewing immunosuppressive regimen and current status with the transplant team
(B) Ensuring optimal oral hygiene and antibiotic coverage if indicated
(C) Scheduling invasive procedures during periods of maximal immunosuppression
(D) Monitoring for signs of infection or rejection

110. Which statement about managing a patient with congestive heart failure (CHF) in the dental clinic is FALSE?
(A) Patients may require a semi-upright position to ease breathing
(B) Use short appointments with adequate rest breaks
(C) Administration of high-dose IV fluids to reduce fluid overload risk
(D) Careful monitoring of vital signs to detect signs of decompensation

111. How does the dental management of a patient with stable angina differ from that of someone with unstable angina?
(A) Stable angina requires immediate IV sedation; unstable angina does not
(B) Unstable angina may contraindicate elective treatment, while stable angina permits controlled appointments
(C) Both conditions demand urgent major dental procedures without delay
(D) There is no difference—both are treated identically

112. In a patient with a well-controlled seizure disorder on phenytoin, which oral manifestation requires ongoing dental vigilance?
(A) Severe tooth mobility

(B) Gingival hyperplasia
(C) Transient ulcers resolved overnight
(D) Hemangioma in the palate

113. A patient on chronic hemodialysis for end-stage renal disease requires multiple extractions. Which strategy is typically advised?
(A) Schedule major dental treatment on the same day just before dialysis
(B) Perform extractions immediately after dialysis on the same day
(C) Treat on a non-dialysis day after consulting the nephrologist
(D) Administer broad-spectrum antibiotics without any other modifications

114. A patient with moderate chronic obstructive pulmonary disease (COPD) becomes dyspneic and anxious during a lengthy root canal session. Which immediate step is advisable?
(A) Recline the patient completely to reduce panic
(B) Administer high-flow oxygen at 12–15 L/min through a non-rebreather mask
(C) Sit the patient upright, give low-flow oxygen, and allow rest
(D) Proceed quickly and ignore the distress

115. Which action is contraindicated when treating a patient with active tuberculosis (TB) in the dental setting?
(A) Deferring non-urgent procedures until the patient is deemed non-infectious
(B) Using high-volume suction and personal protective equipment
(C) Scheduling the patient at a time to limit exposure to others
(D) Providing aerosol-generating treatments in a regular open clinic without respiratory precautions

116. Regarding stress management in an anxious cardiac patient, which approach is NOT typically used?
(A) Short, morning appointments with minimal waiting time
(B) Provision of a calm environment, possibly with mild sedation
(C) Vigorous, forced hyperventilation to reduce stress
(D) Clear communication about procedure steps and breaks

117. How does dental management differ for patients with mild hemophilia versus those with von Willebrand disease when controlling local bleeding?
(A) No difference; both are managed solely by suture
(B) Hemophilia may require factor VIII replacement, while von Willebrand disease often responds to desmopressin
(C) Von Willebrand disease never requires any special measures
(D) Mild hemophilia automatically mandates tooth extraction under general anesthesia

118. In a patient receiving chemotherapy for cancer, why is prophylactic dental evaluation essential prior to treatment initiation?
(A) Chemotherapy only improves oral health
(B) Oral infections or diseased teeth can exacerbate systemic infection risk during immunosuppression
(C) Dental procedures are never performed after chemotherapy
(D) Chemotherapy cures all potential oral pathologies

119. For a patient with platelet count <50,000/µL needing extraction, which local measure is commonly employed to control bleeding?
(A) No additional measures; normal surgical approach
(B) Intravenous immunoglobulins
(C) Topical thrombin, sutures, and possibly a platelet transfusion if severe
(D) Stop the procedure altogether

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120. A 70-year-old with Parkinson's disease complains of difficulty in maintaining oral hygiene due to tremors. Which management approach helps preserve dental health?
(A) Electric toothbrush, stabilized handle, and short recall visits
(B) High-flow oxygen therapy
(C) Immediate full dentures
(D) Restrict all mouth opening exercises

121. A 55-year-old alcoholic patient with cirrhosis is scheduled for multiple restorations. He has mild coagulopathy and recent borderline liver function tests. Which modification is appropriate?
(A) Treat without changing protocol
(B) Request lab updates (INR, platelet count) and minimize invasive procedures if INR >3.5
(C) Full mouth extractions as a preventive measure
(D) Double the local anesthetic dose

122. A 60-year-old female with stable systemic lupus erythematosus (SLE) on low-dose steroids requires extensive crown placements. She reports minimal joint pain but dryness of the mouth. Which measure is crucial in her treatment plan?
(A) Immediate antibiotic prophylaxis
(B) Reinforce salivary substitutes and short chair time
(C) Halting steroids 10 days before
(D) Full sedation with general anesthesia

123. In a known HIV-positive patient, which oral finding should alert the dentist to possible severe immunosuppression?
(A) Mild plaque-induced gingivitis
(B) Hairy leukoplakia on the lateral tongue border
(C) Slight calculus accumulation
(D) Minimal aphthous ulceration healed in 2 days

124. A hypertensive patient shows repeated episodes of faintness during dental procedures. Blood pressure is stable, but the pulse is slow and irregular. Which underlying cause might be considered?
(A) Myxedema coma
(B) Mitral valve prolapse
(C) Sick sinus syndrome or arrhythmic condition
(D) Essential thrombocythemia

125. Which key difference helps distinguish an anaphylactic reaction from a simple vasovagal syncope during local anesthesia administration?
(A) Vasovagal syncope presents with rapid onset hypotension and bronchospasm
(B) Anaphylaxis typically includes urticaria, airway edema, and severe respiratory distress
(C) In anaphylaxis, the patient recovers quickly upon lying supine
(D) Vasovagal syncope shows intense pruritus and rash

126. In a patient with mild Alzheimer's disease presenting for routine restorative treatment, which strategy often improves compliance?
(A) Lengthy appointments with complex instructions
(B) Offering a single long session to complete all procedures
(C) Using repeated simple commands and dividing treatment into short visits
(D) Ensuring they watch entire videos of the procedure

127. A patient with brittle Type 1 diabetes and occasional hypoglycemic episodes arrives for a complex extraction. She reports missing breakfast due to morning nausea. Which precaution is vital?
(A) Proceed immediately since she has stable insulin dosing
(B) Ensure she consumes a carbohydrate source or sweet drink before starting
(C) Double the local anesthesia dosage
(D) Use epinephrine injection to raise blood sugar

128. In a patient with advanced osteoporosis on bisphosphonate therapy, which dental procedure poses the highest risk and requires careful consent?
(A) Simple composite filling
(B) Routine scaling and polishing

(C) Invasive procedures like dental implants or extractions
(D) Orthodontic bracket placement

129. Which principle underlies the use of supplemental oxygen for a patient with angina during a lengthy dental procedure?
(A) Hyperoxygenation decreases myocardial oxygen supply
(B) Supplemental oxygen stabilizes or increases oxygen delivery to ischemic cardiac tissue
(C) Oxygen leads to sedation with no effect on ischemia
(D) Pure oxygen at high flow must be given in every case

130. Which action would be inappropriate for managing a pregnant patient in her third trimester during dental treatment?
(A) Positioning slightly on the left side to avoid supine hypotensive syndrome
(B) Using short, straightforward procedures
(C) Preferring local anesthetics with epinephrine cautiously
(D) Scheduling multiple lengthy procedures under heavy sedation

131. In managing an immunocompromised patient (e.g., HIV, transplant recipient), which measure is LEAST likely to be necessary?
(A) Strict infection control and universal precautions
(B) Possible antibiotic prophylaxis if neutrophil counts are extremely low
(C) Postponing all minor treatments until absolute immunity is normal
(D) Ensuring thorough medical consultation for medication interactions

132. What distinguishes emergency dental care from elective dental care in a medically compromised patient?
(A) Emergency care addresses acute pain/infection that cannot be delayed, while elective care can be postponed until optimal health status
(B) Both must be postponed until the patient is free from any medical condition
(C) Elective care is always delivered first, followed by emergencies
(D) There is no difference; scheduling is purely random

133. A 40-year-old with sickle cell anemia reports severe dental pain. The patient is in mild crisis. What is the immediate dental consideration?
(A) Perform all procedures under local block
(B) Adequate pain management, hydration, and possibly short sedation
(C) Encourage strenuous exercise
(D) Schedule only extensive implant surgery

134. A 58-year-old patient on continuous oxygen therapy for severe COPD requires scaling and root planing. She becomes breathless within minutes of reclining fully. On evaluation, her oxygen saturation drops from 94% to 88%. Which immediate step is appropriate?
(A) Increase oxygen flow and re-position upright
(B) Proceed quickly
(C) Discontinue oxygen altogether
(D) Administer sublingual nitroglycerin

135. A 65-year-old patient with ischemic heart disease, on dual antiplatelet therapy, needs multiple tooth extractions. His physician advises not to discontinue antiplatelets. What dental strategy minimizes bleeding risk?
(A) Perform extractions in multiple segments using local hemostatic aids
(B) Stop aspirin immediately
(C) Proceed with full-mouth extractions in one session
(D) Suturing is unnecessary

136. In a patient with a thyroid disorder, which oral sign might indicate hyperthyroidism decompensation that needs medical evaluation before major dental treatment?
(A) Bradycardia and pale mucosa
(B) Tachycardia, tremors, and heat intolerance

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(C) Coated tongue and low voice
(D) Painless swelling of the floor of the mouth

137. Persistent gum bleeding, fatigue, and multiple bruises in a patient with no known systemic disease might suggest which undiagnosed condition?
(A) Peptic ulcer disease
(B) Leukemia or a platelet disorder
(C) Migraine
(D) Seasonal allergic rhinitis

138. Which protocol is often followed for a pregnant dental patient requiring an emergency radiograph?
(A) Avoid all radiographs until postpartum
(B) Use lead apron and thyroid collar, minimize exposure, proceed if necessary
(C) Require full-body shielding but use maximal exposures
(D) Obtain panoramic, cephalometric, and multiple periapicals simultaneously

139. A 48-year-old male with poorly controlled epilepsy presents with multiple fractured teeth and advanced periodontal disease. He has a record of recent generalized tonic-clonic seizures. He also displays phenytoin-induced gingival overgrowth. He is anxious about any prolonged dental work. Which strategy would best address his dental needs while reducing seizure risk?
(A) Provide sedation in a hospital setting, coordinate with neurology, and perform phased treatments
(B) Stop phenytoin abruptly pre-treatment
(C) Schedule marathon sessions of 4-5 hours
(D) Restrict care solely to scaling

140. A diabetic patient repeatedly presents with diffuse periodontal abscesses, delayed healing, and frequent oral fungal infections. Which factor should be assessed urgently?
(A) Hyperthyroid status
(B) Compliance with glycemic control
(C) Presence of allergies to mouthwash
(D) Calcium intake

141. In patients on immunosuppressants post-transplant, why are orofacial infections more severe?
(A) Immunosuppressants selectively increase salivary defense
(B) They heighten neutrophilic response in the oral cavity
(C) They reduce the immune system's capacity to contain microbial proliferation
(D) Immunosuppression only affects viral infections, not bacterial

142. Assertion: Patients with uncontrolled diabetes are prone to periodontal breakdown.
Reason: Chronic hyperglycemia compromises vascular integrity and immune responses.
(A) Both Assertion and Reason are true, and Reason is the correct explanation
(B) Both Assertion and Reason are true, but Reason is not the correct explanation
(C) Assertion is true, but Reason is false
(D) Assertion is false, but Reason is true

143. In an HIV-positive patient with CD4 count below 200 cells/μL who needs dental surgery, what key measure often helps prevent opportunistic infections?
(A) Universal prophylaxis with antifungal mouth rinses
(B) Antibiotic prophylaxis tailored to neutrophil count and infection risk
(C) Complete ban on local anesthesia
(D) Extended overnight fasting before the procedure

144. Which measure is NOT typically included when preventing infective endocarditis for a high-risk dental patient?
(A) Oral rinse with antimicrobial solution pre-procedure
(B) Antibiotic prophylaxis one hour before the procedure, if indicated
(C) Ensuring meticulous oral hygiene at home
(D) Halting all prophylaxis if the patient already had it last year

145. How does sedation differ for a patient with severe COPD compared to one with controlled anxiety but normal lungs?
(A) COPD patients can safely receive deep sedation using high doses of benzodiazepines
(B) Light conscious sedation with careful respiratory monitoring is preferred in COPD
(C) Both scenarios require identical sedation protocols
(D) COPD patients never require sedation

146. A 72-year-old with stable angina experiences chest discomfort during a root canal. His vitals show mild tachycardia, normal BP, and no ST changes on ECG. What is the best immediate step?
(A) Continue drilling to finish quickly
(B) Stop treatment, provide sublingual nitroglycerin, and reassure
(C) Start high-flow oxygen at 12 L/min
(D) Inject atropine

147. A 45-year-old patient undergoing chemotherapy visits with painful oral ulcers, low WBC count, and fever. He urgently needs drainage of a dental abscess. Which approach is most prudent?
(A) Refuse treatment until chemotherapy ends
(B) Proceed with drainage under antibiotic cover, possibly in a hospital setting
(C) Force a root canal without sedation
(D) Apply only topical anesthetic gel

148. Assertion: Patients with chronic renal failure often exhibit altered drug metabolism and excretion.
Reason: The kidney is primarily responsible for eliminating certain medications and their metabolites.
(A) Both Assertion and Reason are true, and Reason correctly explains the Assertion
(B) Both are true, but Reason is not the correct explanation
(C) Assertion is true, Reason is false
(D) Assertion is false, Reason is true

149. Why is it crucial for a dentist to inquire about herbal supplements during a medication review for medically compromised patients?
(A) Herbal products are always recommended for sedation
(B) Certain supplements can increase bleeding risk or interact with prescription drugs
(C) Herbal supplements have no effect on dental procedures
(D) Herbal products never affect hemostasis

150. For a patient requiring conscious sedation who takes multiple antihypertensives, which protocol aligns with safe practice guidelines?
(A) Abruptly stop antihypertensive drugs to avoid hypotension
(B) Proceed with sedation after verifying stable blood pressure and consulting the physician if needed
(C) Require general anesthesia for all hypertensive patients
(D) Administer double sedation to override high blood pressure

151. In dental practice, "risk assessment" for medically compromised patients is best defined as:
(A) Completely avoiding treatment for any patient with a chronic illness
(B) Evaluating the likelihood of adverse events based on a patient's systemic condition and planning care accordingly
(C) Referring every patient to a tertiary hospital
(D) Performing only prophylactic extractions in these individuals

152. According to standard dental guidelines, which local anesthetic regimen is generally preferred for cardiac patients requiring minor procedures?
(A) Lidocaine 2% with 1:100,000 epinephrine, administered in cautious, limited doses
(B) Bupivacaine plain, no vasoconstrictor
(C) Articaine 4% with 1:50,000 epinephrine in unrestricted volumes
(D) Mepivacaine with high-dose epinephrine in repeated increments

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153. Which rationale supports limiting the use of NSAIDs in patients with chronic kidney disease (CKD)?
(A) NSAIDs directly regenerate nephrons
(B) They can reduce renal blood flow and exacerbate kidney injury
(C) NSAIDs block hepatic enzymes but have no renal effects
(D) CKD patients metabolize NSAIDs more quickly, requiring higher doses

154. Which is NOT a recommended strategy for reducing stress in anxious medically compromised dental patients?
(A) Providing clear explanations and gradual desensitization
(B) Allowing a companion or caregiver in the operatory for support, if suitable
(C) Abruptly starting major procedures without discussion
(D) Offering sedation or relaxation techniques when indicated

155. How does the dental management of a patient with stable bronchial asthma differ from one with acute, uncontrolled asthma?
(A) In stable asthma, elective treatment can proceed with an inhaler at hand; in acute asthma, urgent interventions might need hospital-based care
(B) Both conditions require immediate prophylactic antibiotics
(C) Acute asthma patients seldom face respiratory complications
(D) No difference—manage both identically

156. When considering local anesthetic with adrenaline in a patient taking non-selective beta-blockers (e.g., propranolol), which principle is recommended?
(A) Avoid vasoconstrictors completely
(B) Use minimal adrenaline doses to prevent hypertension and bradycardia
(C) Administer maximum recommended doses of epinephrine
(D) Combine adrenaline with isoproterenol for synergy

157. A 50-year-old patient on anticoagulant therapy (dabigatran) needs a dental extraction. His physician advises against stopping dabigatran. Which immediate measure helps safely manage bleeding risk?
(A) Schedule multiple extractions simultaneously to shorten total procedure time
(B) Use local hemostatic agents like collagen plugs, and carefully suture
(C) Perform partial pulpotomy instead of an extraction
(D) Increase dabigatran dosage to stabilize coagulation

158. A patient with uncontrolled hyperthyroidism arrives unexpectedly with a toothache requiring urgent treatment. Which precaution is critical?
(A) Avoid vasoconstrictors entirely, consider sedation to minimize stress
(B) Encourage the patient to take a brisk walk before the procedure
(C) Administer high-dose thyroid hormone as prophylaxis
(D) Perform full-mouth rehabilitation immediately

159. In a patient taking methotrexate for rheumatoid arthritis, which key action should a dentist consider before scheduling invasive treatment?
(A) Request liver function tests and complete blood count
(B) Stop methotrexate for two months
(C) Use only non-lidocaine local anesthetics
(D) Refer for immediate organ transplant evaluation

160. In treating a patient with a history of stroke (CVA), which approach would be inappropriate?
(A) Scheduling short morning appointments for less fatigue
(B) Keeping blood pressure under observation
(C) Using sedation or anxiety control measures
(D) Advising the patient to stop all antihypertensives before the appointment

161. Which condition is LEAST likely to necessitate antibiotic prophylaxis for invasive dental procedures under current guidelines?
(A) Previous infective endocarditis
(B) A prosthetic heart valve
(C) Rheumatic heart disease without valvular dysfunction
(D) Recent heart transplant with valvulopathy

162. How does managing a diabetic patient who is hypoglycemic in the dental chair differ from handling a vasovagal faint?
(A) Both require trendelenburg positioning only
(B) Hypoglycemia demands rapid glucose administration; vasovagal faint often recovers with supine positioning and ammonia inhalants
(C) Vasovagal faint is best managed with high-flow oxygen, while hypoglycemia is always solved by epinephrine injection
(D) They are managed identically with sedation and no other measures

163. Which measure can help prevent aspiration pneumonia during dental treatment of a patient with neuromuscular swallowing difficulties?
(A) Seating the patient upright, using rubber dam isolation and suction
(B) Encouraging them to eat a large meal immediately before treatment
(C) Avoiding suction to reduce anxiety
(D) Scheduling overnight hospital admission for all procedures

164. A patient with Parkinson's disease struggles to keep the mouth open for extended periods. Which practical modification can improve cooperation?
(A) Use bite blocks or rest periods, scheduling shorter appointments
(B) Insist on forcibly opening the jaw throughout treatment
(C) Avoid local anesthesia to shorten procedure time
(D) Inject botulinum toxin into the masseter

165. For a patient with hemophilia B (Factor IX deficiency) requiring multiple tooth extractions, the dentist should:
(A) Proceed normally without lab checks
(B) Confirm factor levels and coordinate Factor IX replacement therapy pre-procedure
(C) Use only infiltration anesthesia to minimize bleeding
(D) Refer for complete medical clearance but skip any local measures

166. Which action is crucial when a patient with significant cardiovascular disease begins to complain of dizziness mid-treatment?
(A) Increase the chair tilt to full supine without monitoring vitals
(B) Immediately administer intravenous atropine
(C) Pause the procedure, assess blood pressure and heart rate, and check oxygen saturation
(D) Complete the procedure quickly to reduce total stress

167. In caring for a dental patient undergoing chemotherapy who complains of severe xerostomia, which step is NOT advised?
(A) Encouraging frequent sipping of water and use of saliva substitutes
(B) Employing sugar-free lozenges or gum to stimulate residual salivary flow
(C) Regular topical fluoride application to prevent caries
(D) Recommending mouth rinses containing high alcohol content to disinfect

168. Which of the following is NOT a typical complication of intravenous bisphosphonates relevant to dental procedures?
(A) Osteonecrosis of the jaw
(B) High risk of developing alveolar osteitis
(C) Delayed bone healing after extractions
(D) Hypersensitivity reaction to local anesthetics

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169. What distinguishes the dental management of a Type 1 diabetic patient from a Type 2 diabetic patient?
(A) Type 1 patients are unaffected by hypoglycemia
(B) Type 2 patients never take insulin
(C) Type 1 generally relies on insulin, risking acute hypoglycemia if meals are skipped; Type 2 can often control glucose via oral meds or diet
(D) Both types should always fast before treatment

170. A patient with Class III heart failure due to congestive heart disease requires multiple restorative procedures. Which approach is most appropriate?
(A) Provide sedation in a completely supine position for extended visits
(B) Short, staged appointments in a semi-upright position, limiting stress and monitoring vitals
(C) Stop all heart medications prior to the visit
(D) Full general anesthesia in an outpatient setting without cardiology clearance

171. A renal transplant patient on cyclosporine and prednisone presents with swollen, fibrotic gums. Which is the best immediate management approach?
(A) Stop immunosuppressants
(B) Reinforce plaque control, frequent cleanings, and consider gingivoplasty if severe
(C) Prescribe high-dose antibiotics for a month
(D) Perform full-mouth extractions

172. A patient on high-dose steroids for autoimmune disease reports severe facial swelling after a deep carious lesion leads to cellulitis. What key management principle applies?
(A) Limit antibiotic use to topical only
(B) Provide prompt systemic antibiotics, possible drainage, and consider "stress dose" steroids
(C) Immediately discontinue steroid therapy
(D) Perform only palliative care until the infection resolves spontaneously

173. What is a key action when obtaining informed consent from a cognitively impaired older adult?
(A) Skip consent; proceed directly if family is present
(B) Use a simple, clear explanation, and confirm understanding with a caregiver or legal representative when needed
(C) Assume the adult lacks decision-making capacity automatically
(D) Provide an extensive 30-page document without verbal explanation

174. During a seizure in the dental office, which action is INCORRECT?
(A) Gently removing items from the mouth to prevent choking hazards
(B) Protecting the patient's head and allowing the convulsion to pass
(C) Forcibly placing a hard mouth prop between the teeth
(D) Positioning the patient supine and turning them slightly to one side

175. Which finding in a cardiac patient does NOT necessarily mandate postponing elective dental treatment?
(A) Active, unstable angina
(B) Recent myocardial infarction within the past week
(C) Blood pressure of 220/120 mmHg in the office
(D) Well-controlled sinus tachycardia at 90 bpm

176. How does a panic attack in the dental chair differ from acute chest pain due to angina?
(A) Panic attacks are unaccompanied by palpitations or sweating
(B) Angina typically responds to sublingual nitroglycerin, whereas panic often improves with reassurance and controlled breathing
(C) Angina causes hyperventilation and numbness in fingers, whereas panic does not
(D) Both conditions always require immediate nitroglycerin

177. In a patient with mild hemophilia who needs periodontal surgery, which local anesthetic technique is preferable to reduce deep tissue hemorrhage?
(A) Nerve block injections for all quadrants
(B) Infiltration or periodontal ligament injections with added hemostatic measures
(C) No anesthesia to avoid needle trauma
(D) Bilateral mandibular block for convenience

178. A patient with chronic obstructive pulmonary disease (COPD) on inhaled steroids has multiple carious lesions. She experiences frequent oral thrush. Which preventive measure is crucial?
(A) Abruptly stopping inhaled steroids
(B) Rinsing the mouth with water immediately after using the inhaler
(C) High-dose antibiotics for prophylaxis
(D) Restricting fluid intake

179. A 67-year-old patient on multiple antihypertensives reports feeling lightheaded when moved from the dental chair to standing. Which measure reduces orthostatic hypotension episodes?
(A) Transition the patient slowly from supine to upright, allowing time to stabilize
(B) Instruct them to hold their breath and stand abruptly
(C) No special measure—this is a normal response
(D) Immediately administer 1 mg epinephrine intramuscularly

180. A 55-year-old on insulin therapy experiences acute confusion during a filling placement. He is diaphoretic and tachycardic. What is the immediate intervention?
(A) Administer oral glucose if conscious
(B) Proceed quickly with the filling
(C) Call for blood transfusion
(D) Place a bite block and continue

181. A 70-year-old with poorly controlled COPD is scheduled for multiple restorations. She becomes short of breath with minimal exertion. Examination reveals labored breathing and O2 sat at 90%. The dentist plans to use low-flow supplemental oxygen and short appointments. What additional recommendation should be considered?
(A) Hospital-based setting for advanced respiratory support if needed
(B) High-dose IV sedation
(C) Abrupt cessation of all respiratory medications
(D) Restrict antibiotic usage

182. A 60-year-old with advanced cirrhosis has elevated INR (3.2) and mild thrombocytopenia. He needs a failed root canal retreated. Which step is critical prior to endodontic re-treatment?
(A) Platelet transfusion despite mild thrombocytopenia
(B) Oral sedation only
(C) Consultation with a hepatologist to stabilize coagulopathy and plan prophylactic measures
(D) Immediate pulpectomy without checking labs

183. In a patient with AIDS, which oral finding strongly indicates advanced immunosuppression requiring urgent medical follow-up?
(A) Mild plaque accumulation
(B) Large linear ulcers consistent with major aphthae
(C) Kaposi's sarcoma lesions on the palate
(D) Linea alba on the buccal mucosa

184. Persistent bilateral swelling of the parotid region in an adult with Sjögren's syndrome suggests possible development of:
(A) Pleomorphic adenoma
(B) Recurrent sialadenitis
(C) Lymphoma of the salivary gland
(D) Warthin's tumor

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185. How does sedation with nitrous oxide differ from oral benzodiazepines in managing medically compromised dental patients?
(A) Nitrous oxide sedation has a slow onset
(B) Oral benzodiazepines allow immediate titration of sedation depth
(C) Nitrous oxide offers rapid onset and easy titration, while oral benzodiazepines have variable absorption and slower offset
(D) Benzodiazepines rarely cause any respiratory depression

186. A Type 1 diabetic with an HbA1c of 10.5% comes for multiple complex fillings. Which approach is most appropriate?
(A) Proceed with routine care without any modifications
(B) Encourage improved glycemic control before lengthy, elective procedures, addressing any urgent pain or infection promptly
(C) Withhold insulin on the day of treatment
(D) Provide no anesthesia to ensure short visit

187. During a long dental procedure, a 65-year-old patient with coronary artery disease becomes restless, complaining of mild chest pressure. BP is 130/78 mmHg, pulse 88/min. ECG shows no acute changes. The best immediate action is to:
(A) Administer sublingual nitroglycerin and allow rest
(B) Inject IV epinephrine
(C) Continue the procedure until it finishes
(D) Perform chest compressions

188. A patient on dialysis for chronic renal failure complains of toothache. Dialysis is scheduled tomorrow afternoon. When is the best time to treat them?
(A) Immediately after dialysis tomorrow
(B) Right before dialysis tomorrow
(C) On a non-dialysis day, ideally the day after dialysis, consulting with the nephrologist
(D) Late in the evening after a full day of fluid intake

189. Why is antibiotic prophylaxis sometimes required for a patient with a prosthetic joint replacement undergoing invasive dental treatment?
(A) Prosthetic joints are always free from bacteremia risk
(B) All patients with prosthetic joints must have indefinite antibiotics for every dental procedure
(C) Certain high-risk patients might need prophylaxis to prevent hematogenous seeding of the joint
(D) Antibiotics are only useful against viruses

190. Which is NOT a typical reason for preoperative medical consultation in a medically compromised patient?
(A) Suspicion of uncontrolled hypertension
(B) Checking if the patient had lunch
(C) Recent hospitalization for heart failure
(D) Unstable angina with frequent episodes

191. Assertion: Patients with advanced chronic obstructive pulmonary disease (COPD) may require low-flow oxygen supplementation during stressful dental procedures.
Reason: COPD patients typically have a decreased respiratory drive triggered by low oxygen levels rather than high carbon dioxide levels.
(A) Both Assertion and Reason are true, and Reason is the correct explanation
(B) Both Assertion and Reason are true, but Reason is not the correct explanation
(C) Assertion is true, Reason is false
(D) Assertion is false, Reason is true

192. A 28-year-old with congenital heart disease (CHD) and a prosthetic valve is scheduled for deep subgingival scaling. How should the dentist proceed?
(A) Perform scaling without prophylaxis if the patient feels well
(B) Provide antibiotic prophylaxis as per guidelines for prosthetic valves
(C) Schedule frequent local anesthesia blocks to reduce pain
(D) Skip scaling to avoid any risk

193. A 65-year-old on warfarin therapy presents with swelling in the submandibular region, possibly an abscess. INR is 2.8. What is the immediate plan?
(A) Incision, drainage, local measures, and continue warfarin
(B) Cease warfarin abruptly
(C) Schedule a CT scan after 2 weeks
(D) Immediate open surgery without analgesia

194. A 45-year-old alcoholic with cirrhosis arrives with a draining fistula in relation to a grossly decayed lower molar. He reports easy bruising and previous hospitalization for esophageal varices. Laboratory tests show mild thrombocytopenia. Which dental approach ensures safety?
(A) Extract immediately in the dental office without further checks
(B) Coordinate with gastroenterologist for possible platelet support, then carefully extract under local hemostatic measures
(C) Never extract—place a restoration
(D) Refer for partial mandibulectomy

195. A 52-year-old on chronic low-dose methotrexate for psoriatic arthritis presents with severe alveolar bone loss and advanced periodontitis. She experiences frequent mouth ulcers. What is the best dental strategy?
(A) Reinforce oral hygiene, manage ulcers conservatively, and ensure normal blood counts before invasive therapy
(B) Abruptly stop methotrexate
(C) Perform block injections in multiple quadrants
(D) No prophylaxis or lab checks needed

196. In a patient with diabetes reporting a recent surge of oral fungal infections and periodontal breakdown, which systemic factor must be investigated?
(A) Adrenal gland tumor
(B) Thyroid storm
(C) Worsening glycemic control or possible hyperglycemia
(D) Parathyroid adenoma

197. A patient with suspected Addison's disease (primary adrenal insufficiency) complains of chronic fatigue, hyperpigmentation of the oral mucosa, and hypotension. Which test supports this diagnosis?
(A) Fasting blood glucose only
(B) Plasma cortisol levels and ACTH stimulation test
(C) Thyroid function test
(D) Hemoglobin electrophoresis

198. How do oral manifestations in celiac disease differ from those in Crohn's disease?
(A) Celiac leads predominantly to recurrent aphthous ulcers; Crohn's presents with cobblestone mucosa and deep fissures
(B) Both cause granulomatous lesions
(C) Crohn's rarely involves the oral cavity
(D) Celiac never has oral manifestations

199. In a patient with Alzheimer's disease who repeatedly forgets postoperative instructions, what adjustment can best ensure compliance and safety?
(A) Provide thorough written and verbal instructions to a responsible caregiver
(B) Avoid giving any instructions altogether
(C) Telephonic instructions in advanced medical terminology
(D) Mandate hospital stay for every procedure

200. A 64-year-old with high blood pressure and angina requires a lengthy crown preparation. Which practical measure helps reduce cardiac stress during this procedure?
(A) Eliminate breaks and complete treatment nonstop
(B) Provide preoperative sublingual nitroglycerin if indicated, schedule a short morning appointment, and allow rest periods
(C) Keep the patient supine for 3 hours
(D) Use high-dose epinephrine infiltration to ensure no pain

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CHAPTER 11

ORAL RADIOLOGY

1. Which of the following best defines the term "ionization" in the context of radiation physics?
   (A) The generation of photons without electron displacement
   (B) The alteration of neutron numbers in an atom's nucleus
   (C) The removal or addition of electrons from an atom or molecule
   (D) The production of purely elastic collisions between subatomic particles

2. Which type of radiation has the highest frequency among the following?
   (A) Microwave
   (B) Infrared
   (C) Gamma rays
   (D) Visible light

3. What is the primary reason X-rays can produce biological changes in tissues?
   (A) Their high-speed electrons induce chain reactions in cell membranes
   (B) Their photon energy causes ionization leading to molecular disruption
   (C) Their large mass disrupts nuclear stability in target tissues
   (D) Their low penetrative capacity concentrates damage superficially

4. Which of the following is NOT a feature of X-rays?
   (A) They travel at the speed of light
   (B) They have no electrical charge
   (C) They have a variable mass dependent on frequency
   (D) They can be produced when high-speed electrons strike a target

5. How do characteristic X-rays differ from bremsstrahlung X-rays in dental radiography?
   (A) Characteristic X-rays arise from electron deceleration near the nucleus, while bremsstrahlung arises from electron shell transitions
   (B) Characteristic X-rays have a continuous energy spectrum, while bremsstrahlung has discrete energies
   (C) Characteristic X-rays result from electron shell transitions, while bremsstrahlung arises from electron deceleration near the nucleus
   (D) Both types are identical in origin but differ only in intensity

6. Which beam quality control measure is considered most vital for reducing patient dose in dental radiography?
   (A) Thick tungsten filtration
   (B) Proper collimation
   (C) Aluminum anode choice
   (D) Using a stationary anode

7. When adjusting the kilovoltage (kV) in a dental X-ray unit, what primary effect does increasing kV have on the resulting radiograph?
   (A) Increases magnification
   (B) Increases contrast
   (C) Decreases sharpness
   (D) Decreases contrast

8. A patient's panoramic radiograph shows a region of blurred maxillary molars. Which immediate step should the operator take to ensure a clear image in subsequent exposures?
   (A) Lower the kilovoltage
   (B) Adjust the patient's chin position
   (C) Reduce the source-to-object distance
   (D) Increase the film–screen contact

9. What key adjustment is recommended when using the bisecting angle technique in periapical radiography?
(A) Position the film parallel to the tooth
(B) Align the central ray perpendicular to the film
(C) Place the film at a 45° angle to the tooth
(D) Direct the central ray perpendicular to the bisector of the angle formed by the tooth and film

10. In a sequence of panoramic radiograph preparations, which step is INCORRECT?
(A) Instruct the patient to remove jewelry
(B) Position the chin too low intentionally
(C) Use a bite block to stabilize the dental arches
(D) Align the Frankfort plane parallel to the floor

11. In radiation biology, which cell type is most likely to exhibit the highest radiosensitivity based on the law of Bergonié and Tribondeau?
(A) Mature nerve cells
(B) Erythroblasts in bone marrow
(C) Muscle fibers
(D) Fully differentiated osteocytes

12. Increased mA (milliampere) settings in a dental X-ray machine generally cause which radiographic change?
(A) Greater image contrast but same density
(B) Decreased image density but improved sharpness
(C) Increased image density but no effect on contrast
(D) Reduced scatter and lower patient dose

13. A 40-year-old patient with chronic periodontitis complains of intermittent tooth pain. A periapical radiograph suggests possible pulpitis. The dentist plans to evaluate bone loss extent. Which radiograph is preferred?
(A) Occlusal radiograph
(B) Panoramic radiograph
(C) Vertical bitewing radiograph
(D) Lateral oblique mandible view

14. A dentist notices a radiolucent area near the apex of a mandibular molar. Which diagnosis is most likely if the lesion's border appears well-defined and corticated on the radiograph?
(A) Radicular cyst
(B) Osteosarcoma
(C) Periodontal abscess
(D) Cementoma

15. If a patient requires multiple intraoral radiographs in a single visit, which scheduling strategy minimizes cumulative radiation dose?
(A) Perform all radiographs in scattered intervals
(B) Space radiographs over consecutive days
(C) Use the fastest receptor available in one session
(D) Recommend sedation to reduce motion artifacts

16. According to the ALARA principle (As Low As Reasonably Achievable), which protocol best helps minimize radiation exposure?
(A) Using round collimators for all exams
(B) Employing rectangular collimation and high-speed detectors
(C) Increasing exposure time to guarantee clarity
(D) Mandating lead aprons only for pediatric patients

17. Which finding on a radiograph should prompt an immediate referral due to a potential malignancy?
(A) Well-demarcated radiolucency with a thin sclerotic border
(B) Irregular radiolucency displaying a "sunburst" periosteal reaction
(C) Mixed radiolucent-radiopaque lesion with concentric layers
(D) Uniformly radiopaque lesion near an impacted tooth

18. Which radiographic sign is most indicative of a cystic lesion in the jaw?
(A) Cotton wool appearance
(B) Floating teeth
(C) Onion-skin periosteal reaction
(D) Well-defined radiolucency with a radiopaque margin

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19. Assertion (A): Stochastic effects of radiation, such as carcinogenesis, have no threshold dose.
Reason (R): Radiation-induced mutations are considered random events that can occur with any dose, although likelihood increases with dosage.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, R is false
(D) A is false, R is true

20. In monitoring occupational radiation exposure for dental staff, which measure is most recommended?
(A) Use of TLD or film badges on a monthly basis
(B) Annual chest X-rays for all staff
(C) Mandatory sedation for anxious patients
(D) Rely solely on patient screening

21. Which test best ensures the consistency of X-ray output from a dental radiography unit over time?
(A) Coin test
(B) Step wedge test
(C) Collimator alignment test
(D) Safelight test

22. A 28-year-old patient complains of sensitivity in the maxillary incisor region after orthodontic treatment. Radiographs show slight root resorption. The dentist wants a detailed view of local structures. Which technique is ideal?
(A) Occlusal radiograph
(B) Periapical paralleling technique
(C) Panoramic radiograph
(D) MRI scan

23. A 60-year-old patient with limited mouth opening due to temporomandibular joint disorder struggles during intraoral radiography. The dentist suspects alveolar crest pathology around the molars. Conventional bitewings prove challenging. The practitioner must still evaluate interproximal bone levels accurately without causing discomfort. Which alternative radiograph should be used?
(A) Panoramic radiograph
(B) Lateral oblique jaw view
(C) Extraoral bitewing technique
(D) Occlusal radiograph

24. A 50-year-old patient with poorly controlled diabetes presents with chronic periodontitis. The dentist observes suspicious radiolucencies near the mandibular premolar roots on bitewings. Pain is moderate, and mobility is noted. Which initial radiographic step refines the diagnosis?
(A) CBCT scan
(B) Panoramic radiograph
(C) Full-mouth periapical series
(D) Lateral oblique mandible view

25. A 55-year-old smoker reports diffuse jaw discomfort and occasional numbness in the mandibular anterior region. He has a history of periodontal bone loss. On clinical examination, grade II mobility is noted in lower incisors. Soft tissue appears normal, but panoramic radiography reveals irregular radiolucency surrounding the roots. There is no evident swelling or sinus tract. The dentist suspects a malignancy or advanced osteomyelitis. To clarify the nature and extent of the lesion, which advanced radiographic modality should be considered next?
(A) Cephalometric analysis
(B) CBCT
(C) Occlusal radiograph
(D) Lateral oblique mandible

26. Which statement defines the half-value layer (HVL) in radiation physics?
(A) The thickness of a material that doubles X-ray intensity
(B) The thickness of a material that reduces radiation intensity by half
(C) The maximum penetration depth of X-ray photons
(D) The shortest wavelength in the X-ray beam

27. Which unit measures the absorbed dose of radiation in tissue?
(A) Coulomb per kilogram (C/kg)
(B) Gray (Gy)

(C) Sievert (Sv)
(D) Becquerel (Bq)

28. Why does dental film have a lead foil backing?
(A) To increase film speed
(B) To reduce scattered radiation reaching the film
(C) To improve the visible light sensitivity
(D) To make the film more flexible

29. Which material is NOT commonly used in dental X-ray tube construction?
(A) Tungsten
(B) Aluminum
(C) Copper
(D) Mercury

30. What is the major difference between direct and indirect digital imaging sensors in dentistry?
(A) Direct sensors produce a latent image on film, whereas indirect sensors capture data on phosphor plates
(B) Direct sensors require chemical processing, whereas indirect sensors do not
(C) Indirect sensors use a phosphor plate that requires scanning, whereas direct sensors instantly produce a digital image
(D) Both rely on separate scanning steps, but use different scanning frequencies

31. A patient with a gag reflex struggles with conventional periapical films for the maxillary molars. Which alternative method is most appropriate for reducing gagging while obtaining diagnostic images?
(A) Panoramic radiograph
(B) Use of a rigid sensor with no modifications
(C) Increase exposure time for a quicker shot
(D) Bisecting angle with smaller film or sensor size

32. Which scenario best illustrates the influence of focal spot size on image sharpness?
(A) Larger focal spot producing sharper images
(B) Smaller focal spot producing sharper images
(C) Focal spot size only affects image contrast
(D) Focal spot size only matters in panoramic machines

33. If a radiograph appears underexposed and too light, which corrective measure is generally recommended?
(A) Decrease kilovoltage
(B) Decrease milliampere
(C) Increase exposure time or mA
(D) Use a higher-grade film

34. To minimize overlap of contacts in bitewing radiographs, the central ray should be directed:
(A) Perpendicular to the long axis of the tooth
(B) Through the open embrasure of the targeted teeth
(C) At an oblique angle to ensure a broader view
(D) Vertically down the midline

35. Which is an INCORRECT protocol for storing and handling digital PSP plates?
(A) Protect them from ambient light using light-tight pouches
(B) Clean them gently to remove debris
(C) Store them in humid areas to keep the plate surface moist
(D) Erase any residual image before reusing

36. Which patient population is at greatest risk of developing stochastic radiation effects from dental X-rays?
(A) Infants and children
(B) Middle-aged adults
(C) Elderly patients with low bone density
(D) There is no difference in risk among age groups

37. Decreasing the focal film distance in intraoral radiography tends to cause which effect?
(A) Less magnification and increased sharpness
(B) More magnification and less sharpness
(C) Reduced density and increased contrast
(D) No significant change in image geometry

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38. A 45-year-old patient returns for follow-up after root canal therapy on a mandibular first molar. He complains of persistent dull pain. A periapical radiograph suggests a periapical radiolucency has slightly enlarged. The dentist suspects a vertical root fracture. Conventional periapical views are inconclusive. Which imaging modality would best confirm the fracture?
(A) Panoramic radiograph
(B) CBCT
(C) Occlusal radiograph
(D) MRI

39. Which radiographic feature is most indicative of an internal resorption lesion?
(A) A radiopaque mass within the pulp chamber
(B) An enlarged pulp chamber with uniform radiolucency
(C) A small external defect on the root surface
(D) A thickened lamina dura around the apex

40. If a small retake is needed due to positioning error, what immediate management step is recommended to minimize patient dose?
(A) Repeat the entire series for consistency
(B) Retake only the specific radiograph
(C) Increase mA to shorten exposure
(D) Delay all radiographs until the next visit

41. According to FDA and ADA guidelines, when is routine panoramic screening recommended for asymptomatic adult patients with no significant clinical findings?
(A) Every 6 months
(B) Every year
(C) Every 3–5 years
(D) Panoramic screening is never recommended

42. Which panoramic radiograph finding warrants further investigation for possible pathology?
(A) Bilaterally symmetrical mandibular condyles
(B) Thin but continuous lamina dura around teeth
(C) A solitary, well-defined radiolucency in the ramus region of unknown origin
(D) Impacted third molars in the normal eruption pathway

43. Which radiographic sign may indicate early-stage periapical pathology?
(A) Thickening of the periodontal ligament space
(B) Hypercementosis at the tooth apex
(C) Fused roots of multiple teeth
(D) Sclerotic bone formation at the apex

44. Assertion (A): Filtration in dental X-ray tubes removes high-energy photons.
Reason (R): Filtration is introduced to protect tissues from long-wavelength, low-energy X-rays that contribute little to image formation.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, R is false
(D) A is false, R is true

45. What is the standard lead equivalent thickness recommended for protective aprons in dental radiography?
(A) 0.5 mm
(B) 0.1 mm
(C) 1.0 mm
(D) 2.0 mm

46. How can one assess the darkroom safelight condition in a film-based setup?
(A) Step wedge test
(B) Coin test
(C) Focal spot test
(D) Timer accuracy test

47. A pediatric patient with small mouth opening needs a radiograph of the maxillary anterior region. The dentist wants to check for supernumerary teeth. Which intraoral projection is typically recommended?
(A) Maxillary occlusal radiograph
(B) Bitewing radiograph
(C) Panoramic radiograph
(D) Periapical paralleling technique

48. A 12-year-old child with ankyloglossia presents for orthodontic evaluation. The dentist needs to assess developing tooth buds in the mandible and check for possible midline supernumerary teeth. Mouth opening is limited, and the child struggles with periapical films. Which radiograph can provide the required information without significant discomfort?
(A) Lateral oblique mandible
(B) Panoramic radiograph
(C) Mandibular occlusal radiograph
(D) Extraoral bitewing

49. A 30-year-old patient experiences persistent facial pain and swelling in the maxillary premolar region. Clinical exam reveals a sinus tract. The dentist suspects an odontogenic source with possible chronic infection. Which radiograph provides a detailed two-dimensional assessment of the maxilla?
(A) Posteroanterior skull radiograph
(B) Water's view
(C) Maxillary occlusal radiograph
(D) Submentovertex view

50. A 47-year-old female patient presents with an ill-fitting upper denture, nasal regurgitation of fluids, and chronic congestion. She reveals a history of maxillary sinus surgery. On inspection, there is a small defect in the hard palate. A periapical radiograph is inconclusive. The dentist suspects an oroantral communication complicating the denture fit. Radiographic evaluation must delineate sinus anatomy, any bony defects, and the integrity of the maxilla. Which imaging modality will best provide a comprehensive view to aid diagnosis?
(A) Occlusal radiograph
(B) Panoramic radiograph
(C) CBCT
(D) Lateral skull radiograph

51. Which statement best defines "magnification factor" in dental radiography?
(A) The ratio of focal spot size to object size
(B) The extent to which the radiographic image is larger than the actual object
(C) The mathematical difference in radiopacity between two structures
(D) The measure of penumbra affecting film sharpness

52. Which imaging modality primarily uses high-frequency sound waves for diagnostic evaluation in dentistry?
(A) Computed Tomography
(B) Ultrasound
(C) Magnetic Resonance Imaging
(D) Digital Subtraction Radiography

53. What is a key advantage of digital subtraction radiography in periodontal assessment?
(A) It eliminates the need for strict standardization of radiographic angles
(B) It reliably distinguishes small changes in bone density between two time points
(C) It only requires a single radiographic exposure
(D) It eliminates operator error in positioning entirely

54. All of the following are commonly visualized using Magnetic Resonance Imaging (MRI) in dentistry EXCEPT:
(A) Soft-tissue lesions of the oral cavity
(B) Temporomandibular joint disc position
(C) Bone marrow changes in the mandible
(D) High-detail enamel thickness analysis

55. Which key distinction typically exists between conventional CT and Cone Beam Computed Tomography (CBCT) for dental applications?
(A) Conventional CT uses lower radiation doses than CBCT
(B) CBCT provides 2D slice data without volumetric reconstruction
(C) CBCT often delivers a reduced dose and a focused field of view
(D) Conventional CT cannot visualize soft tissues while CBCT can

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56. Which advanced imaging technique is particularly effective for diagnosing pathology in the salivary glands, such as identifying sialoliths or duct obstructions?
(A) MRI
(B) Sialography
(C) Nuclear Scintigraphy
(D) Digital Subtraction Radiography

57. When interpreting a panoramic radiograph, the dentist notes a ghost image of an earring. What is the practical step to prevent such artifact on a future panoramic exam?
(A) Increase exposure time
(B) Decrease kilovoltage
(C) Ensure removal of metallic objects prior to imaging
(D) Ask the patient to swallow before exposure

58. A dentist suspects an abnormal lesion within the mandible on a panoramic radiograph. Which immediate imaging step is best to further characterize the lesion in multiple planes without unnecessarily high radiation?
(A) Full-mouth periapical series
(B) High-dose conventional CT
(C) Cone Beam Computed Tomography (CBCT)
(D) Occlusal radiograph

59. What essential preparation should a patient undergo before a Cone Beam Computed Tomography scan for dental implant planning?
(A) Rinse with chlorhexidine mouthwash to reduce oral bacteria
(B) Wear a thyroid collar to minimize radiation to the thyroid gland
(C) Avoid taking any analgesics for 24 hours
(D) Undergo sedation to remain completely still

60. In the recommended protocol for panoramic imaging, which of the following steps is INCORRECT?
(A) Asking the patient to place the tongue at the roof of the mouth
(B) Positioning the Frankfort plane parallel to the floor
(C) Using a lead apron without a thyroid collar
(D) Directing the patient to bite correctly on the bite-block

61. Which area in the head and neck region generally has the highest likelihood of scatter radiation exposure during a routine intraoral dental radiograph?
(A) Cervical spine region
(B) Gonadal region
(C) Contralateral parotid gland
(D) Thyroid gland

62. Improper vertical angulation in a periapical radiograph commonly leads to which image distortion?
(A) Overlapping of contacts
(B) Motion blur of root tips
(C) Foreshortening or elongation of tooth length
(D) Double exposure artifacts

63. A 35-year-old patient presents with a jaw swelling. A panoramic radiograph suggests a large radiolucency in the right mandible. The dentist requires cross-sectional detail but seeks a lower dose option. Which imaging?
(A) MRI
(B) Lateral oblique mandible
(C) Conventional CT
(D) CBCT

64. A radiographic image shows a multilocular “soap bubble” radiolucency in the posterior mandible. Which pathology is most commonly associated with this appearance?
(A) Periapical cyst
(B) Ameloblastoma
(C) Paget’s disease
(D) Osteoradionecrosis

65. A new digital radiography system is installed in a dental clinic. To ensure consistent image quality and safety, which daily check is most important?
(A) Checking the tube head vacuum seals
(B) Verifying the digital sensor’s cable length

(C) Calibrating the X-ray output using a step wedge or reference device
(D) Performing a lead apron integrity test

66. According to the NCRP (National Council on Radiation Protection) recommendations, which of the following is a key protocol to limit operator exposure?
(A) Standing at the patient's side to reassure them during exposure
(B) Using open-ended PID with no collimation
(C) Maintaining at least 6 feet and a 90–135° angle from the X-ray source
(D) Holding the film in the patient's mouth

67. Which radiographic finding in the jaw is a red flag that often necessitates prompt biopsy?
(A) A small, round radiolucency with a sclerotic border around a root apex
(B) A large unilocular radiolucency showing tooth displacement
(C) A poorly defined, mottled radiolucency with cortical bone destruction
(D) A radiopaque lesion at the site of a previous extraction

68. Which radiographic finding is often associated with a long-standing periapical granuloma that has transformed into a radicular cyst?
(A) Rapidly expansive, multilocular radiolucency
(B) Diffuse radiopacity with no radiolucent rim
(C) A well-defined radiolucency with a corticated border
(D) Irregular patchy translucencies with scattered calcifications

69. Assertion (A): Rapidly dividing cells are highly radiosensitive.
Reason (R): Mitochondrial damage is the primary cause of radiation-induced cell death.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, R is false
(D) A is false, R is true

70. A dentist wants to reduce operator dose from scatter radiation in a busy radiographic suite. Which action most effectively lowers cumulative operator exposure?
(A) Increasing kV to shorten exposure times
(B) Standing behind a protective barrier or wall
(C) Using a rotating anode tube instead of a stationary one
(D) Performing daily machine output calibrations

71. Which periodic quality control test checks for adequate alignment of the X-ray beam with the film or sensor in intraoral radiography?
(A) Step wedge test
(B) Collimator test
(C) Half-value layer test
(D) Coin test

72. A pediatric patient presents with facial trauma. The dentist suspects a fractured zygomatic arch. Traditional intraoral films are inadequate. Which extraoral radiographic view is most appropriate for initial assessment?
(A) Towne's view
(B) Submentovertex (SMV) view
(C) Water's view
(D) Lateral cephalogram

73. A 42-year-old patient complains of chronic orofacial pain, suspecting TMJ involvement. Physical examination reveals clicking and mild limitation of mandibular movement. The dentist needs a detailed view of joint components, including the articular disc. Conventional panoramic radiographs show only bony outlines. Which diagnostic imaging modality best assesses soft tissue?
(A) CBCT
(B) MRI
(C) Lateral oblique jaw view
(D) Plain TMJ radiographs

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74. A 60-year-old patient with an edentulous maxilla exhibits chronic sinusitis and nasal regurgitation through an oroantral fistula. Panoramic radiographs show alveolar ridge resorption. Which imaging method is most beneficial to precisely evaluate sinus floor integrity before potential surgical closure?
(A) Periapical radiographs
(B) CBCT
(C) Occlusal radiograph
(D) Water's view

75. A 50-year-old patient receives dental implants in the anterior mandible. Six months post-surgery, the patient develops numbness in the lower lip and chin, suggesting potential injury to the mental nerve. A panoramic exam shows the implants to be close to the mental foramina, but the two-dimensional view lacks clarity on nerve involvement. The practitioner considers an advanced imaging modality to evaluate the precise distance between the implant apices and the nerve canal. Which technique best provides high-resolution cross-sectional slices with relatively low radiation dose?
(A) MRI
(B) Conventional CT
(C) CBCT
(D) Occlusal radiograph

76. How does the principle of intensifying screens function in extraoral radiography?
(A) By converting light photons to X-rays
(B) By amplifying the X-ray beam to reduce exposure times
(C) By filtering out scattered radiation before it reaches film
(D) By providing high-resolution digital images without a sensor

77. Which tissue is most resistant to ionizing radiation damage based on general radiosensitivity guidelines?
(A) Lymphoid tissue
(B) Mucous membranes
(C) Salivary glands
(D) Neurons

78. Why is the paralleling technique preferred over the bisecting angle technique for most periapical radiographs?
(A) Paralleling technique shortens the object-to-film distance
(B) It produces a more accurate representation of tooth length without magnification
(C) The bisecting technique uses a more consistent vertical angulation
(D) The paralleling technique is simpler to perform for all patients

79. Each of the following procedures helps minimize radiation dose in digital radiography EXCEPT:
(A) Selecting a higher speed image receptor
(B) Using rectangular collimation
(C) Checking and reducing retakes
(D) Using lower kilovoltage without adjusting other parameters

80. How do T1-weighted and T2-weighted MRI images typically differ in appearance of fluid-filled structures?
(A) T1 highlights fluid as hyperintense (bright) while T2 shows fluid as hypointense (dark)
(B) Both T1 and T2 display fluid as dark
(C) T2 shows fluid as bright, whereas T1 typically shows fluid as darker
(D) Fluid appears equally bright on both sequences

81. A dentist discovers consistent vertical root fractures on older root canal-treated teeth. Which imaging approach best confirms these hard-tissue fractures with minimal artifacts?
(A) Panoramic radiography
(B) MRI
(C) CBCT with limited field of view
(D) Conventional CT of the entire mandible

82. In panoramic radiography, failure to position the patient's head such that the Frankfort plane is parallel to the floor can result in:
(A) Excessive vertical magnification with no effect on horizontal dimensions
(B) Insufficient horizontal coverage of the anterior teeth

(C) A radiograph with distinct ring artifacts
(D) Distortion or incorrect angulation of the maxillary and mandibular arches

83. A partial denture framework has fractured twice. The dentist suspects improper metal thickness or stress concentration. Which radiographic method can evaluate the framework's metal structure?
(A) Direct digital periapical film
(B) MRI
(C) CBCT
(D) None of these methods adequately evaluate metal frameworks

84. In digital radiography, which feature allows enhancement of minute details for closer inspection without altering the original data?
(A) DICOM editing
(B) Windowing/leveling
(C) Hard copy film printing
(D) Phosphor plate erasure

85. A new dental assistant is practicing infection control protocols for intraoral radiography. Which of the following steps is INCORRECT?
(A) Covering the digital sensor with a disposable barrier
(B) Disinfecting the X-ray tube head and control panel after each patient
(C) Reusing disposable bite blocks if only used once
(D) Wearing gloves while positioning the sensor in the patient's mouth

86. Which group is statistically more susceptible to radiation-induced thyroid carcinoma following dental radiography without protective measures?
(A) Older males
(B) Middle-aged females
(C) Pediatric patients
(D) Geriatric patients

87. Excessive forward positioning of a patient's head in a panoramic unit typically results in what effect on the anterior teeth in the final image?
(A) Anterior teeth appear magnified
(B) Anterior teeth appear narrowed
(C) Anterior teeth show ghost images
(D) Anterior teeth become uniformly radiopaque

88. A 67-year-old patient with squamous cell carcinoma of the tongue is undergoing radiation therapy. The oncologist requests regular radiographs to monitor teeth at risk of radiation caries. Which strategy helps minimize additional radiation to already irradiated tissues while maintaining essential dental diagnostic follow-ups?
(A) Perform panoramic radiographs monthly
(B) Take full-mouth series every 6 weeks
(C) Use individualized radiographic selection criteria
(D) Avoid all radiographs until therapy concludes

89. A panoramic radiograph reveals a unilateral radiopaque mass near the angle of the mandible, resembling the shape of a salivary gland stone, but located below the inferior border. Which diagnosis is most likely?
(A) Sialolith in the submandibular duct
(B) Calcified lymph node
(C) Osteoma of the mandible
(D) Compound odontoma

90. A patient's radiation badge report shows consistently higher-than-recommended exposures. Which action should the dental office take first?
(A) Immediately cease all radiographs for three months
(B) Dismiss the staff member involved
(C) Conduct a thorough evaluation of operator technique and equipment calibration
(D) Switch to only panoramic radiography

91. Which international guideline aims to optimize radiation protection for both patients and healthcare workers in dental radiology?
(A) HIPAA
(B) OSHA Bloodborne Pathogens Standard

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(C) ICRP recommendations
(D) ADA Code of Ethics

92. Which panoramic radiograph clue is a red flag for systemic disease such as hyperparathyroidism?
(A) Multiple retained roots with normal lamina dura
(B) Generalized thinning or loss of the lamina dura around teeth
(C) Dense calcifications in the pulp chambers
(D) Bilateral exostoses on the lingual aspects of the mandible

93. On a panoramic radiograph, which finding might suggest an impacted mandibular third molar is associated with a dentigerous cyst?
(A) Radiopacity enveloping the entire crown
(B) A distinct radiolucent rim around the crown's pericoronal space
(C) Root resorption of adjacent second molar with no pericoronal space
(D) A layered "onion-skin" periosteal reaction

94. Assertion (A): A thyroid collar is optional for panoramic imaging.
Reason (R): The X-ray beam in panoramic radiography is directed upward, typically sparing the thyroid region from significant direct exposure.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, R is false
(D) A is false, R is true

95. A middle-aged patient has had multiple retakes of periapical radiographs in the same region due to difficulty with proper positioning. Which immediate management step helps break this cycle of overexposure?
(A) Continue retakes until a perfect image is achieved
(B) Use a Snap-A-Ray or positioner with a more comfortable approach
(C) Increase the exposure time to ensure the image is dark enough
(D) Stop attempting that view indefinitely

96. Which test is periodically performed to ensure the X-ray beam penetrates at the intended kilovoltage (kVp)?
(A) Timer accuracy test
(B) mA linearity test
(C) kVp calibration test
(D) Fog test

97. A 32-year-old pregnant patient needs a radiograph to diagnose a suspected vertical root fracture in a maxillary premolar. Which step is crucial to protect the fetus without compromising diagnostic needs?
(A) Use panoramic radiography
(B) Place a lead apron with thyroid collar
(C) Increase exposure distance significantly
(D) Postpone all radiographs until after delivery

98. A 65-year-old patient scheduled for head and neck radiation therapy asks about potential complications to the jaw. The dentist discusses possible osteoradionecrosis (ORN). To assess baseline bone status and plan preventive measures, the dentist opts for imaging. Which modality provides an excellent hard-tissue baseline at a relatively modest dose?
(A) Occlusal film series
(B) CBCT
(C) MRI
(D) Cephalometric radiograph

99. A 58-year-old patient with advanced periodontitis is undergoing periodontal surgery. The periodontist observes suspected furcation involvement on the mandibular molars clinically. Panoramic images are inconclusive. Which imaging approach provides localized, detailed views of root anatomy and bony defects?
(A) Vertical bitewings
(B) Full-mouth periapical series
(C) MRI of the mandible
(D) Lateral oblique jaw

100. A 72-year-old patient with a history of radiation therapy for nasopharyngeal carcinoma presents for a dental checkup. The dentist notes severe xerostomia and potential carious lesions at cervical areas. The patient complains of difficulty opening the mouth fully. Standard intraoral films cause discomfort. Radiographic evaluation is necessary to assess the extent of cervical caries and alveolar bone support in multiple quadrants. Which alternative imaging approach could yield diagnostic images with minimal patient discomfort and reasonable detail of interproximal areas?
(A) Full-mouth periapical series with smaller films
(B) Vertical bitewing radiographs
(C) Panoramic radiograph plus selective periapicals
(D) Extraoral bitewing technique

101. Which term describes the reduction in the intensity of an X-ray beam as it passes through matter?
(A) Absorption coefficient
(B) Attenuation
(C) Excitation
(D) Radioactive decay

102. Which tissue or organ has the lowest permissible dose threshold during head and neck radiotherapy due to its critical function?
(A) Parotid gland
(B) Spinal cord
(C) Mandibular bone
(D) Buccal mucosa

103. Why are scintigraphy (bone scans) occasionally used in maxillofacial assessments?
(A) To view a high-resolution image of the sinus walls
(B) To detect changes in bone metabolism or turnover
(C) To eliminate the need for any dental radiographs
(D) To produce an immediate cross-sectional image of facial bones

104. All of the following radiographic signs can suggest osteomyelitis of the jaw EXCEPT:
(A) Moth-eaten radiolucencies
(B) Irregular areas of sequestra
(C) Widened periodontal ligament spaces
(D) Well-defined, corticated unilocular lesions

105. How does manual film processing differ from automatic film processing in dental radiography?
(A) Manual processing uses developer and fixer, while automatic uses only developer
(B) Automatic processing typically maintains optimal temperatures and timing automatically
(C) Manual processing takes less time than automatic
(D) Automatic processors eliminate the need for a darkroom

106. Which factor is paramount for accurate bone height measurement on a bitewing radiograph in periodontal assessment?
(A) Excessively high kilovoltage
(B) Proper vertical angulation
(C) Extended exposure time
(D) Use of rigid, large-size sensors

107. A dentist notices motion blur in a series of pediatric bitewing radiographs. Which immediate measure can improve clarity?
(A) Increase the film's object-to-receptor distance
(B) Use a faster exposure time
(C) Switch to a panoramic radiograph
(D) Position the tube head 10 inches from the patient's face

108. If initial periapical radiographs appear underdeveloped (light and grainy), which step should the operator take first in a manual processing setup?
(A) Increase fixing time
(B) Raise the temperature or extend time in the developer
(C) Use a higher-powered safelight
(D) Shorten drying time to preserve film detail

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109. When using the paralleling technique for periapical radiographs, which key positioning action reduces image distortion?
(A) Aligning the beam at 45° to the film
(B) Keeping the film and tooth parallel to each other
(C) Placing the film at a steep angle to the long axis of the tooth
(D) Directing the beam from an occlusal orientation

110. Which protocol step is INCORRECT when safely storing unexposed dental X-ray films?
(A) Keep them in a cool, dry place away from direct heat
(B) Store them in proximity to strong disinfectant fumes for sterilization
(C) Protect them from light exposure
(D) Use lead-lined storage if possible to avoid scatter from nearby sources

111. In terms of risk from radiation-induced cancer, which group is most likely to be affected by repeated unnecessary dental radiographs?
(A) Middle-aged adults with no comorbidities
(B) Patients with advanced age and minimal dental needs
(C) Pediatric patients with developing tissues
(D) Individuals with edentulous arches

112. Excessive horizontal angulation in bitewing radiography commonly leads to which artifact?
(A) Overlapping of interproximal contacts
(B) Fogged images
(C) Foreshortening of crown height
(D) Cone-cut edges

113. A 70-year-old patient complains of a persistent nonhealing ulcer in the posterior tongue region. Which imaging modality can best assess soft-tissue extension and potential lymph node involvement?
(A) CT scan
(B) Plain panoramic radiograph
(C) Occlusal radiograph
(D) MRI

114. A dentist observes a “sunburst” periosteal reaction in the mandible on a radiograph. This finding is most characteristic of:
(A) Osteosarcoma
(B) Chronic osteomyelitis
(C) Radicular cyst
(D) Ameloblastoma

115. A new digital panoramic unit is installed. To ensure accurate patient dosing, the dentist should first:
(A) Increase default exposure parameters for maximum clarity
(B) Use the adult setting for all patients uniformly
(C) Perform acceptance tests and set exposure protocols according to manufacturer guidelines
(D) Only operate the unit on pediatric patients initially

116. According to the ALARA principle, which practice is strongly recommended for reducing patient dose in dental radiography?
(A) Universal use of round collimators
(B) Using lead aprons and thyroid collars whenever feasible
(C) Eliminating filtration from the X-ray tube
(D) Repeating radiographs if results are only slightly suboptimal

117. Which radiographic feature in the mandible most warrants further evaluation for malignancy?
(A) A unilocular radiolucency with a thin sclerotic margin
(B) Generalized horizontal bone loss around multiple teeth
(C) An irregular, moth-eaten radiolucency with cortical perforation
(D) A mixed radiolucent-radiopaque lesion with dense calcifications

118. A radiograph shows an unerupted mandibular third molar with a distinct radiolucent space attached at the cementoenamel junction. This suggests:
(A) Periapical abscess
(B) Dentigerous cyst

(C) Stafne bone defect
(D) Central giant cell granuloma

119. Assertion (A): Rectangular collimators increase patient dose compared to round collimators.
Reason (R): Rectangular collimation restricts the beam area more effectively, reducing scatter radiation to surrounding tissues.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, R is false
(D) A is false, R is true

120. A dental assistant has become pregnant. What is the recommended approach for radiation safety regarding her duties taking radiographs?
(A) Prohibit her from all radiographic duties
(B) Provide appropriate protective measures and maintain safe operating distances
(C) Increase kV settings to reduce mA and time
(D) Only allow her to take panoramic images, not intraoral

121. Which quality control test ensures that all darkroom chemicals are functioning correctly and consistently?
(A) Safelight coin test
(B) Step wedge test with control film
(C) Collimator alignment test
(D) kVp accuracy test

122. A 28-year-old patient with advanced localized juvenile periodontitis needs precise evaluation of interproximal bone loss around first molars. Which radiographic approach is most informative for measuring vertical bone defects?
(A) Vertical bitewings
(B) Panoramic radiograph
(C) Occlusal radiograph
(D) MRI scan

123. A 63-year-old patient reports a history of nasopharyngeal carcinoma treated with radiation therapy. He complains of pain near a previously root canal–treated molar. Radiographs show a suspicious periapical radiolucency. Because of prior radiation, the dentist suspects osteoradionecrosis. Which advanced imaging method best delineates bone viability and potential sequestra?
(A) CBCT
(B) Sialography
(C) Radionuclide bone scan
(D) Ultrasound

124. A 50-year-old patient undergoing chemotherapy has severe periodontal disease with deep pockets around posterior teeth. Panoramic imaging is inconclusive about the extent of vertical bone loss. Which next radiographic approach offers the most clarity regarding periodontal support in these sites?
(A) Horizontal bitewings
(B) Vertical bitewings
(C) Lateral cephalogram
(D) MRI

125. A 59-year-old female patient with a history of maxillary sinus surgeries presents with suspected oroantral communication after tooth extraction. She reports a whistling sound when speaking and occasional fluid leakage into the nose. A panoramic radiograph suggests a radiolucent defect near the sinus floor, but details are insufficient. The dentist plans an advanced imaging study to determine the size, location, and bony boundaries of the defect for surgical closure. Which imaging modality best provides a three-dimensional view of the maxillary sinus and alveolar bone with moderate radiation exposure?
(A) MRI
(B) Medical-grade CT
(C) Water's radiograph
(D) CBCT

126. What does the concept of "absorbed dose" specifically measure in radiation units?
(A) Amount of ionization in air
(B) Energy deposited by radiation per unit mass in tissue

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(C) Probability of inducing cancer
(D) The biological effectiveness of radiation

127. Which type of personnel dosimeter uses lithium fluoride crystals to record accumulated radiation exposure?
(A) Film badge
(B) Thermoluminescent dosimeter (TLD)
(C) Optically stimulated luminescence (OSL) badge
(D) Digital electronic dosimeter

128. Why is scatter radiation a significant concern in dental radiography?
(A) Scatter is essential to form a high-contrast image
(B) Scatter intensifies beam quality for deeper penetration
(C) Scatter increases the radiation dose to tissues beyond the area of interest
(D) Scatter is entirely eliminated by rectangular collimation

129. Each of the following is a recommended method to minimize motion artifacts in panoramic radiography EXCEPT:
(A) Ensuring the patient's chin is placed in the chin rest or cup
(B) Asking the patient to remain still throughout the exposure
(C) Using a rigid head positioner to stabilize the skull
(D) Instructing the patient to move their jaw slightly to prevent muscle stiffness

130. How do direct digital sensors (CCD/CMOS) differ from photostimulable phosphor (PSP) plates in routine dental imaging?
(A) CCD/CMOS sensors require scanning, while PSP plates produce an immediate image
(B) PSP plates can be reused indefinitely without quality degradation, while CCD/CMOS sensors cannot
(C) CCD/CMOS sensors provide an immediate on-screen image, while PSP plates must be scanned
(D) PSP plates are thicker and more rigid than direct sensors

131. Which imaging method is typically most appropriate for an overall evaluation of dentoalveolar trauma in a child who may also have jaw fractures?
(A) Bitewing radiographs
(B) Panoramic radiograph
(C) CBCT
(D) Occlusal radiograph

132. A dentist needs to localize a supernumerary tooth in the anterior maxilla using two periapical films. Which principle guides the shift shot technique for determining buccal or palatal position?
(A) Principle of infiltration
(B) Parallax or Clark's rule
(C) The SLOB rule (Same Lingual, Opposite Buccal)
(D) Angulation inversion rule

133. If an operator identifies repeated processing artifacts on manually processed films (dark spots, stains), what is the best initial step?
(A) Replace the entire processing unit
(B) Clean and replenish processing solutions, ensuring the work area is tidy
(C) Cease all manual processing and shift to digital sensors
(D) Accept the artifacts if images remain legible

134. What key positioning feature must be followed when using the occlusal radiograph technique for the maxilla?
(A) Position the film parallel to the mid-sagittal plane
(B) Angle the X-ray beam 90° to the long axis of the film
(C) Direct the beam from below the chin to capture the upper arch
(D) Place the film with its white side facing the maxillary arch

135. Which action is INCORRECT when preparing a patient for a lateral cephalometric radiograph?
(A) Removing all extraoral metal objects
(B) Positioning the Frankfort plane parallel to the floor
(C) Encouraging the patient to tilt the head back to enhance soft tissue profile
(D) Ensuring the patient's midsagittal plane is perpendicular to the film

136. Which patient is statistically most likely to develop osteoradionecrosis following dental extractions?
(A) A child receiving prophylactic antibiotic coverage
(B) A middle-aged adult who had a single panoramic X-ray
(C) An elderly patient undergoing radiation therapy for oral cancer
(D) A young adult with no history of radiation exposure

137. Increasing the source-to-object distance in intraoral radiography typically results in:
(A) Larger magnification of the tooth image
(B) Reduced magnification and improved sharpness
(C) Darker film density regardless of mA
(D) Increased scatter but less patient dose

138. A 55-year-old patient presents with a suspected fracture of the coronoid process following trauma. The dentist attempts periapical and panoramic views, but the region appears obscured. Which specialized extraoral projection is most helpful for visualizing the coronoid process in isolation to confirm fracture lines?
(A) Lateral cephalogram
(B) Submentovertex view
(C) Reverse Towne's view
(D) Occlusal radiograph

139. A radiograph reveals bilateral radiopaque masses near the angle of the mandible, located below the inferior alveolar canal. These are likely:
(A) Sialoliths of Wharton's duct
(B) Submandibular salivary gland calcifications (antroliths)
(C) Tonsilloliths
(D) Stafne bone defects

140. A previously calibrated X-ray unit suddenly produces consistently dark images. What should be done first?
(A) Reduce exposure time settings
(B) Replace the X-ray tube head
(C) Check developer solution concentration and temperature
(D) Increase film–object distance

141. Which standard precaution regarding lead apron usage applies when taking intraoral radiographs in a general dental practice?
(A) Lead aprons are required only for pregnant patients
(B) Lead aprons are always used to shield the torso and gonads, with a thyroid collar recommended when possible
(C) Lead aprons are optional if using rectangular collimation
(D) Lead aprons cannot be used with digital sensors

142. A radiograph of the anterior maxilla shows a "ground-glass" or "orange-peel" appearance. Which condition is often associated with this pattern?
(A) Ameloblastoma
(B) Paget's disease
(C) Periapical cemento-osseous dysplasia
(D) Odontoma

143. Which radiographic sign strongly suggests pulp canal calcification due to trauma or chronic inflammation?
(A) A periapical radiolucency around the tooth's apex
(B) A narrow, obliterated pulp chamber with little visible canal space
(C) A sclerotic border around the root
(D) A distinct radiopaque line traversing the pulp chamber

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144. Assertion (A): A higher kVp usually results in lower image contrast in dental radiographs.
Reason (R): Increased kVp generates X-rays with greater penetrating power, producing more varied shades of gray.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, R is false
(D) A is false, R is true

145. A well-maintained automatic processor suddenly begins producing films with a brownish tint after fixing. What is the most appropriate immediate action?
(A) Increase the temperature to improve fixing
(B) Check the fixer solution for depletion or contamination
(C) Rinse films for a shorter time
(D) Switch to manual processing

146. Which specialized imaging technique compares baseline and follow-up radiographs, highlighting even subtle density changes by subtracting the two images?
(A) Digital Subtraction Radiography
(B) Conventional tomography
(C) MRI with contrast
(D) Panoramic layering

147. A 35-year-old patient with extensive subgingival calculus needs a thorough view of posterior interproximal areas, including advanced bone loss. Which intraoral radiograph type best visualizes deep periodontal defects?
(A) Panoramic
(B) Horizontal bitewing
(C) Vertical bitewing
(D) Lateral cephalogram

148. A 45-year-old patient has a persistent draining sinus tract near the mandibular molar area. The dentist suspects a chronic periapical lesion or osteomyelitis. Standard periapical radiographs show a poorly defined radiolucency. Which imaging method helps delineate the lesion's three-dimensional extent for possible surgical intervention without incurring excessively high dose?
(A) Full medical CT
(B) MRI
(C) CBCT
(D) Extraoral bitewings

149. A 60-year-old patient presents with bilateral swelling in the submandibular region. The dentist suspects sialolithiasis or duct obstruction. Which specialized radiographic test can best visualize the submandibular ductal system and identify possible stones or strictures?
(A) Sialography
(B) CBCT
(C) Lateral oblique jaw view
(D) Digital subtraction radiography

150. A 54-year-old patient who underwent external beam radiation for oropharyngeal carcinoma presents with limited mouth opening and pain around the mandibular molars. A panoramic radiograph shows ill-defined radiolucencies near the roots. The dentist worries about osteoradionecrosis or severe chronic infection. Evaluating lesion extent and bone viability is critical. Plain films are inadequate. What imaging approach, providing a comprehensive 3D bone assessment and feasible in a dental office, would help determine surgical debridement needs?
(A) Panoramic tomography with specialized filters
(B) CBCT
(C) MRI with gadolinium
(D) Mandibular occlusal radiograph

151. Which of the following best defines the concept of "effective dose" in radiation protection?
(A) The total dose received by the entire body over time

(B) A measure that accounts for both dose and radiation type, but not tissue sensitivity
(C) A summation of absorbed dose in all radiosensitive tissues, weighted by their relative sensitivities
(D) A fixed regulatory value for occupational exposure

152. Which protective measure is MOST recommended for operators repeatedly taking intraoral radiographs in a busy practice?
(A) Holding the film in the patient's mouth during exposure
(B) Standing at least 6 feet away and behind a protective barrier
(C) Lowering the mA to below recommended levels
(D) Wearing lead gloves instead of using a barrier

153. Why does increasing kilovoltage (kV) in an X-ray unit typically reduce the contrast of a radiograph?
(A) Fewer photons reach the film or sensor
(B) Higher energy photons penetrate tissues more uniformly
(C) It causes more scattered radiation to create white lines
(D) The film's emulsion hardens and loses responsiveness

154. All of the following help ensure consistent image quality in digital radiography EXCEPT:
(A) Regularly calibrating digital sensors with manufacturer software
(B) Performing background erasure for phosphor plates
(C) Frequently reformatting the system's hard drive to store more images
(D) Checking display monitor brightness and contrast settings

155. How does conventional tomography differ from computed tomography (CT) in visualizing the jaws?
(A) Conventional tomography provides 3D reconstructions, whereas CT produces only 2D views
(B) CT uses rotational X-ray beams and computer processing, whereas conventional tomography relies on synchronized tube-film movements
(C) Both systems yield identical multiplanar images
(D) Conventional tomography requires intravenous contrast for maximum clarity, whereas CT does not

156. Which single measure most effectively prevents retakes in pediatric patients with a strong gag reflex during intraoral radiography?
(A) Using a panoramic radiograph for all children
(B) Employing distraction techniques and child-friendly explanations
(C) Increasing the exposure time to capture the image faster
(D) Using cold air to numb the palate

157. A dentist finds extraneous black lines crossing several film radiographs after manual processing. Which practical step can resolve this artifact?
(A) Stir the fixer solution more vigorously
(B) Ensure the processing hangers and racks are free of static electricity
(C) Switch the developer and fixer times
(D) Use a warmer developer temperature to reduce lines

158. If a digital intraoral sensor repeatedly displays "hot spots" of extreme brightness in the same area, what is the dentist's best immediate course of action?
(A) Lower the kV setting
(B) Discontinue using the sensor and have it inspected for defects
(C) Increase the source-to-object distance
(D) Manipulate the brightness on the computer's display

159. When using a thyroid collar during periapical radiography, how should the collar be positioned?
(A) Below the clavicles, covering the chest
(B) Placed loosely around the neck to permit beam entry

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(C) Snugly wrapped around the neck, shielding the thyroid without impeding the X-ray beam
(D) Positioned at the back of the neck only

160. In preparing an adult patient for CBCT of the maxilla, which step is INCORRECT?
(A) Asking the patient to remove dental prostheses, earrings, and necklaces
(B) Stabilizing the head within the CBCT unit's head rest or chin cup
(C) Positioning the occlusal plane severely upward so the sinuses are entirely in the beam
(D) Ensuring the patient holds still while the rotating arm completes its scan

161. Which group is at highest risk for thyroid damage from repeated dental radiography without protective measures?
(A) Postmenopausal women
(B) Middle-aged men who smoke
(C) Younger females, especially pediatric age
(D) Elderly patients with osteoporosis

162. Excessive vertical angulation in the bisecting angle technique primarily leads to:
(A) Elongation of the tooth on the radiograph
(B) Foreshortening of the tooth on the radiograph
(C) Overlapping of proximal surfaces
(D) Cone cuts at the apical region

163. A 39-year-old patient has persistent pain post-endodontic treatment in a maxillary molar. The standard periapical radiograph is inconclusive. Which advanced imaging best reveals untreated accessory canals or periapical lesions?
(A) Panoramic
(B) MRI
(C) CBCT
(D) Occlusal radiograph

164. A panoramic radiograph shows a radiopaque lesion at the inferior border of the mandible, below the mandibular canal, approximately 1 cm in diameter. It appears well-defined and corticated. Which diagnosis is MOST likely?
(A) Odontoma
(B) Sialolith
(C) Stafne bone defect (static bone cavity)
(D) Osteomyelitis with sequestrum

165. A dentist receives a high reading on the monthly radiation badge report. After investigating operator position and barriers, no major faults are found. What next action is most appropriate?
(A) Discontinue all radiographs indefinitely
(B) Replace and recalibrate the personal dosimeter
(C) Require the operator to stand in the same position but use a lead glove
(D) Increase the daily number of radiographs to spread out the exposure time

166. Which protocol regarding radiation protection does the International Commission on Radiological Protection (ICRP) strongly recommend?
(A) Eliminating all X-ray-based imaging in pediatric patients
(B) Using proper selection criteria and shielding to adhere to ALARA
(C) Mandating daily CT scans for all orthodontic treatments
(D) Relying solely on panoramic images for endodontic diagnosis

167. Which radiographic appearance in the maxilla suggests a high-risk lesion that warrants immediate referral?
(A) A unilocular radiolucency associated with an impacted canine
(B) A well-defined cystic area around a vital tooth
(C) A mixed radiolucent-radiopaque lesion with ill-defined borders and bone destruction
(D) A radiopaque area at the apex of a treated tooth

168. Which radiographic sign typically indicates a chronic sclerosing osteomyelitis response in the mandible?
(A) A moth-eaten radiolucency with no reaction
(B) A sunray periosteal pattern
(C) Diffuse increased radiopacity with a surrounding radiolucent halo
(D) A multilocular "soap bubble" appearance

169. Assertion (A): Panoramic radiographs provide the same level of detail for interproximal caries detection as bitewing radiographs.
Reason (R): Panoramic images are taken with a curved receptor and a rotational beam, often yielding a broad overview but less spatial resolution for fine details.
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is false, R is true
(D) A is true, R is false

170. A patient has repeatedly lost small lead foil pieces into the waste stream after film packet opening. Which management step is most appropriate to reduce environmental contamination?
(A) Burn the foil in the office incinerator
(B) Collect and dispose of lead foils as regulated hazardous waste
(C) Flush lead foil fragments down the sink in a sealed bag
(D) Discontinue using lead foil–backed films entirely

171. Which test is used periodically to evaluate the alignment of the X-ray beam with the sensor or film to prevent cone cuts?
(A) Collimator congruence test
(B) Timer accuracy test
(C) mA linearity test
(D) Darkroom safelight coin test

172. A 70-year-old patient presents with limited mouth opening post-radiation therapy for oral cancer. The dentist suspects alveolar bone necrosis in the anterior mandible. Which radiograph can best confirm localized cortical integrity?
(A) Occlusal radiograph
(B) MRI
(C) CBCT
(D) Extraoral bitewing

173. A 65-year-old patient completed head and neck radiotherapy six months ago. He now presents with a draining sinus in the posterior mandible and complains of dull pain. Standard periapical and panoramic radiographs indicate irregular bone loss. The dentist needs to evaluate viability of bone and early sequestra. Which imaging?
(A) MRI
(B) CBCT
(C) Nuclear medicine bone scan
(D) Lateral oblique jaw view

174. A 55-year-old patient has severe xerostomia and gingival recession after radiation therapy for nasopharyngeal carcinoma. He presents with cervical caries under fixed prostheses. Routine periapical radiographs are compromised by limited mouth opening. Which alternative radiograph can reveal these lesions effectively?
(A) Vertical bitewing
(B) Extraoral bitewing
(C) Lateral cephalogram
(D) Maxillary occlusal view

175. A 63-year-old patient with a history of partial mandibulectomy and reconstructive surgery for oral cancer returns for evaluation. A panoramic image shows an irregular radiolucency near the grafted site, but definitive borders are unclear. The dentist worries about possible recurrent tumor infiltration or necrotic graft material. Intraoral films are challenging due to tissue scarring. The surgeon requests a comprehensive volumetric assessment to plan biopsy. Which imaging modality, available in many dental clinics, best balances detailed bone visualization and moderate radiation exposure for surgical planning?
(A) MRI
(B) Conventional medical CT

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(C) CBCT
(D) Tomographic panoramic series

176. What is the concept of "half-value layer" (HVL) in the context of dental X-ray beam quality?
(A) The thickness of filter needed to absorb half the scattered photons
(B) The amount of time required for the X-ray tube to halve its output
(C) The filter thickness that reduces the X-ray beam's intensity by 50%
(D) The distance from the source at which beam intensity halves

177. Which particle type is responsible for the majority of X-ray photon production in a dental X-ray tube via bremsstrahlung radiation?
(A) High-speed electrons decelerating near tungsten nuclei
(B) Protons striking the tungsten filament
(C) Neutrons absorbed by the anode target
(D) Positrons colliding with an aluminum filter

178. Why is kilovoltage more influential than milliamperage in determining X-ray beam penetration?
(A) kV controls the number of electrons, while mA only sets the speed
(B) Higher kV increases photon energy, enabling deeper tissue penetration
(C) mA alone modifies scatter radiation
(D) Both kV and mA have no effect on beam penetration

179. All of the following radiographic patterns are considered typical of malignant bone lesions EXCEPT:
(A) Moth-eaten radiolucency
(B) Ill-defined or ragged borders
(C) Localized sclerotic rim surrounding a radiolucent lesion
(D) Cortical bone perforation and soft tissue extension

180. How do Compton scatter and the photoelectric effect differ in dental radiography?
(A) Only Compton scatter results in ionization of tissue atoms
(B) Photoelectric effect occurs at higher photon energies, while Compton scatter dominates at lower energies
(C) Compton scatter results in a scattered photon with reduced energy, whereas the photoelectric effect fully absorbs the photon
(D) They are actually the same process but named differently

181. In a dental office, which scenario requires that staff wear their personal dosimeters consistently?
(A) Staff members not involved in taking radiographs
(B) Dental hygienists who stand behind a protective barrier each exposure
(C) Any personnel who could potentially receive occupational exposure
(D) Only staff who operate panoramic machines

182. A dentist observes repeated elongation of roots on periapical films when using the paralleling technique. Which adjustment corrects this error?
(A) Decrease vertical angulation
(B) Increase horizontal angulation
(C) Shift to a larger sensor size
(D) Move the film closer to the tooth

183. If a new digital sensor consistently shows "dead pixel" lines across images, rendering them diagnostically questionable, the dentist should:
(A) Increase exposure parameters to override the dead pixels
(B) Disable the software's calibration feature
(C) Stop using that sensor and contact the manufacturer for repair or replacement
(D) Attempt to reformat the practice's computer system

184. What key action should be taken for a final check on darkroom integrity in film-based radiography?
(A) Shine a bright flashlight in the darkroom briefly

(B) Measure temperature of the fixer solution
(C) Conduct a safelight coin test
(D) Stir the developer solution vigorously

185. Which is an INCORRECT protocol for scheduling panoramic radiographs to minimize patient dose?
(A) Following ADA/FDA guidelines for selection criteria
(B) Recommending a new panoramic for every routine 6-month recall
(C) Using lead aprons and thyroid collars whenever feasible
(D) Considering patient history and specific diagnostic needs

186. Which patient is most likely to develop radiation caries, necessitating shorter recall intervals for dental imaging?
(A) A healthy young adult with routine hygiene
(B) A child with minimal sugar intake and good sealants
(C) A post-radiotherapy head and neck cancer patient
(D) An elderly edentulous patient with well-fitting dentures

187. Decreasing the object-to-film distance in the paralleling technique tends to:
(A) Increase magnification of the tooth image
(B) Decrease magnification and improve sharpness
(C) Cause more scattered radiation
(D) Lead to greater distortion in the crown area

188. A 60-year-old patient complains of persistent, painless swelling in the posterior mandible. Radiographs show a well-defined radiolucency with internal septations. Which advanced imaging helps clarify bony expansion for surgical planning?
(A) MRI
(B) CBCT
(C) Lateral oblique jaw view
(D) Transcranial TMJ view

189. A 42-year-old patient with advanced chronic periodontitis requires pre-surgical mapping of intrabony defects around mandibular molars. Standard bitewings show alveolar crest levels but are limited in depicting the 3D topography. The dentist seeks detailed cross-sectional data without resorting to hospital-based CT. Which imaging modality is ideal?
(A) Occlusal radiograph
(B) MRI
(C) CBCT
(D) Panoramic radiograph

190. A 59-year-old patient with squamous cell carcinoma of the maxilla has undergone partial maxillectomy. A recent panoramic radiograph indicates a possible pathological fracture near the surgical site. Which advanced radiographic examination provides the clearest bony detail for confirming a fracture line?
(A) MRI
(B) CBCT
(C) Sialography
(D) Extraoral bitewings

191. A 66-year-old patient presents with persistent oronasal communication following resection of a palatal tumor and subsequent radiation therapy. He experiences fluid regurgitation into the nose and difficulty with prosthesis retention. Panoramic radiography shows a large radiolucent defect in the palate, yet the dentist needs clearer 3D details of bony walls around the defect for potential surgical reconstruction. Conventional CT is available at a hospital but involves higher dose and scheduling delays. Which dental-based imaging modality is preferred for both alveolar detail and moderate radiation exposure?
(A) Water's view
(B) Cephalometric radiograph
(C) CBCT
(D) Dental film tomography

192. Which term describes the quantity of radiation or energy transferred to a specific volume of air, measured in coulombs per kilogram (C/kg)?
(A) Absorbed dose
(B) Equivalent dose

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(C) Exposure
(D) Effective dose

193. In the context of radiation therapy for head and neck cancers, which salivary gland is most commonly affected by xerostomia?
(A) Parotid gland
(B) Sublingual gland
(C) Minor labial glands
(D) Von Ebner's glands

194. What is the primary justification for routine use of intensifying screens in extraoral film radiography (e.g., panoramic)?
(A) They increase the contrast of the final image
(B) They reduce the patient's radiation dose by requiring fewer photons
(C) They automatically collimate the X-ray beam
(D) They convert visible light into X-ray photons

195. All of the following are recommended steps in managing a pregnant staff member's occupational radiation exposure EXCEPT:
(A) Providing a personal dosimeter specifically worn at waist level
(B) Restricting the staff member from all radiographic procedures
(C) Ensuring adequate barriers and distance during exposures
(D) Maintaining standard lead apron use

196. How does a panoramic radiograph generally differ from a full-mouth periapical (FMX) series in diagnosing periapical pathology?
(A) Panoramic radiographs always show finer detail than an FMX
(B) FMX typically provides higher resolution per tooth
(C) Both produce identical coverage of the jaws
(D) Panoramic films exclude the mandible entirely

197. Which single intervention best maintains image quality and reduces dose when switching from film-based panoramic radiography to digital panoramic radiography?
(A) Using extra-thick intensifying screens
(B) Decreasing the kilovoltage below recommended levels
(C) Properly calibrating the digital sensor and machine settings
(D) Extending the scan time to ensure thorough coverage

198. In a busy oral radiology department, films begin showing brownish discoloration over time. Staff suspect incomplete fixation. Which practical measure solves this issue?
(A) Double the developer time
(B) Ensure the fixer is fresh and films are rinsed thoroughly
(C) Expose the film to bright light after removing from fixer
(D) Shorten the wash cycle to speed processing

199. A child repeatedly bites down on wired digital sensors, risking damage. The dentist aims to protect the sensor and avoid retakes. Which approach is best?
(A) Place a rigid bite block with protective cover and calmly train the child
(B) Increase the exposure to shorten the scan
(C) Use extraoral bitewings on all children
(D) Reinforce the wire with more tape

200. When performing an extraoral bitewing, what key action ensures the beam is aimed correctly at the posterior teeth?
(A) Directing the central ray at the mid-sagittal plane
(B) Positioning the film under the chin
(C) Aligning the PID so the beam passes between the first and second molars
(D) Rotating the tube head 90° from the occlusal plane

Solutions

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CHAPTER 01

DENTAL MATERIALS

1. (B) Dental Materials Science

   Dental Materials Science focuses on understanding physical, chemical, and biological properties of materials used in dental applications, ensuring that restorations and prostheses perform effectively under oral conditions. Option (A) covers metals but not other restorative materials. Option (C) explores biologically inspired methods, which is broader than dental-focused science. Option (D) deals with prosthetics specifically, rather than the full scope of materials for restorative, preventive, and auxiliary uses. By examining composition and behavior of substances, Dental Materials Science ensures clinicians can select and manipulate materials properly for patient care.

2. (C) To prevent harmful tissue reactions

   Biocompatibility signifies that materials will not provoke adverse tissue responses, such as inflammation, toxicity, or allergic reactions, once placed in the oral cavity. Though cost (A) and handling (B) are practical considerations, they do not address the body's tolerance of these materials. Faster placement (D) is advantageous but secondary to ensuring patient safety. By adhering to biocompatibility standards, dental practitioners protect oral tissues and general health. Materials like alloys, cements, and polymers must pass stringent evaluations so that they can safely remain in the oral environment.

3. (C) Physical and chemical properties together define overall performance

   Physical properties—like strength, hardness, elasticity, and thermal expansion—determine how a material withstands masticatory forces and temperature fluctuations. Chemical properties—such as setting reactions, solubility, and corrosion resistance—affect stability and compatibility with oral tissues. If either aspect is overlooked, failures like restoration fracture, marginal leakage, or biocompatibility issues can arise. (A) and (B) are incomplete: esthetics, biocompatibility, and structural resilience depend on more than a single property type. (D) is incorrect because these properties strongly impact service life. Understanding both ensures clinicians choose the best material for lasting restorations.

4. (D) Rapid galvanic corrosion rate

   A rapid galvanic corrosion rate is undesirable because it degrades metallic restorations, leads to failure, and can cause patient discomfort or metallic tastes. High compressive strength (A) is necessary for withstanding biting forces. A low coefficient of thermal expansion (B) helps maintain a stable interface with tooth structure, reducing microleakage. Low solubility (C) prevents dissolution or degradation in saliva. Thus, anything that accelerates corrosion is detrimental to a restoration's function and longevity. Avoiding galvanic corrosion helps maintain structural integrity and patient comfort over the restoration's lifespan.

5. (B) Better color matching

   Polymer-based restorative materials, particularly resin composites, can be closely matched to the color of natural teeth, giving them a significant esthetic advantage over metallic restorations. Metals possess higher tensile strength (A) and can generally withstand higher temperatures (C). Polymers typically have some degree of polymerization shrinkage (D); in fact, controlling shrinkage is a challenge with resin-based composites. Their outstanding advantage remains their ability to blend visually with surrounding dentition, thus meeting patient demands for a more natural appearance without compromising reasonable functional strength.

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6. (C) High compressive strength and wear resistance

Posterior restorations must endure large masticatory forces and abrasive challenges during chewing, making compressive strength and wear resistance crucial. While esthetics (A) may be desired, function and longevity are paramount in posterior teeth. A very low modulus of elasticity (B) can lead to flexure and potential failure at the margins. Rapid setting (D) is helpful clinically but not at the cost of suboptimal mechanical properties. A material that is strong under stress and resistant to abrasion will better preserve tooth structure and ensure long-term restorative success.

7. (B) Excellent esthetic match

A fractured incisor restoration usually sits in a visible area of the mouth, so matching the color, translucency, and surface texture of the natural tooth is vital. High opacity (A) could make a restoration look unnaturally dense and compromise aesthetics. While thermal conductivity (C) can be relevant, it is not the most critical factor for anterior esthetics. Low bond strength (D) is undesirable because a stable union between restoration and tooth is necessary. Hence, materials like resin composites with good color matching and bonding capacity are typically preferred.

8. (C) Yield strength

Yield strength is the stress point at which a material begins to deform plastically. Beyond this level, deformation becomes permanent, and the material will not return to its original shape. The proportional limit (B) is the maximum stress at which stress is directly proportional to strain, but once passed, non-linear behavior sets in. Elastic limit (A) is very similar to proportional limit but refers strictly to the point after which permanent deformation occurs. Fatigue strength (D) deals with a material's endurance over cyclical loads. Yield strength focuses specifically on stress tolerance before plastic deformation.

9. (A) Hardness

Hardness indicates how well a material resists localized plastic deformation such as indentation or abrasion. Malleability (B) refers to the ability to be hammered or rolled into thin sheets. Ductility (C) is the capacity of a material to be drawn out into wires without breaking. Resilience (D) measures the amount of energy a material can absorb and release without permanent deformation. For many dental materials—like amalgam or composite—the hardness property is crucial for withstanding occlusal forces and wear, ensuring durability of restorations against masticatory stresses.

10. (D) It affects marginal seal with tooth structure

The coefficient of thermal expansion (CTE) describes how much a material expands or contracts with temperature changes in the oral cavity (e.g., hot drinks, cold foods). A significant mismatch between the restoration's CTE and that of natural tooth structure can cause stress at the interface, eventually leading to microleakage, secondary caries, or restoration failure. Saliva pH (B) and color stability (C) are not directly governed by CTE, and setting times (A) relate more to chemical reactions than thermal properties. Controlling CTE compatibility is crucial for long-term success and patient comfort.

11. (D) Radio-opacity

While radio-opacity is an important diagnostic feature (useful for viewing restorations on radiographs), it is not typically classified as a basic chemical property. Corrosion susceptibility (A) evaluates how a material reacts chemically over time. Setting reaction type (B) describes chemical changes from a fluid/paste to a hardened state. Water sorption (C) evaluates how much water the material absorbs, affecting properties like dimensional stability. Radio-opacity, while clinically relevant, is more of a radiographic characteristic than a fundamental chemical property that determines the chemical stability or reaction behavior of a material.

12. (B) Fluoride release

Glass ionomer cements (GIC) can release fluoride, which contributes to inhibiting secondary caries and protecting adjacent tooth structure. Resin composites typically offer superior esthetic matching (A) and polishability (C), making them ideal for visually demanding restorations. While GIC can chemically bond to tooth structure, composites generally achieve higher bond strength to enamel (D) when used with proper bonding agents. Thus, GIC's fluoride release remains a key

advantage, particularly in patients with high caries risk or areas where additional cariostatic benefit is desired.

13. (B) Fluoride-releasing capability

Class V restorations at the cervical region may be prone to recurrent decay, particularly in patients at high caries risk. Fluoride-releasing materials, such as glass ionomer cements, help reduce bacterial activity and remineralize nearby tooth structure. While compressive strength (A) is beneficial in load-bearing restorations, class V lesions typically experience minimal occlusal forces. Translucency (C) is more relevant for highly visible areas but not as critical as caries prevention. Low surface hardness (D) is not advantageous since materials need to resist abrasion near the gingival margin. Fluoride release offers significant protective benefits here.

14. (B) Composite resin

Composite resins require a dry field to ensure proper bonding to tooth structure. Moisture contamination can disrupt bonding agents, leading to compromised adhesion, postoperative sensitivity, or microleakage. Glass ionomer cements (A) are somewhat tolerant of moisture, although they still benefit from controlled conditions. Gold foil (C) and dental amalgam (D) do not rely on adhesive bonding to tooth structure, although contamination can affect other aspects of placement. For composites, dryness is particularly essential to achieve an effective seal and prolonged restoration longevity.

15. (A) Inadequate tooth isolation

Inadequate tooth isolation during composite placement can introduce moisture, saliva, or blood, compromising the bond between the restoration and tooth. This leads to marginal breakdown and shortened restoration lifespan. While overzealous polishing (B) might cause minor surface issues, it generally does not severely reduce longevity. Proper light-curing (C) ensures full polymerization, and incremental placement (D) helps minimize polymerization shrinkage. Failure to maintain dryness critically impairs the adhesive interface, leading to microleakage, post-operative sensitivity, and eventual restoration failure. Thus, correct isolation is pivotal for high-quality composite restorations.

16. (C) Improved mechanical strength

Filler particles, commonly silica or glass, significantly strengthen the resin matrix by increasing the material's ability to bear occlusal loads. They also reduce shrinkage and improve wear resistance, making the restoration more durable. Although improper filler addition could raise surface roughness (B), modern composites are engineered for a smooth finish through careful formulation and polishing protocols. Incorporating fillers typically reduces solubility rather than increasing it (A). Working time (D) is mainly governed by photoinitiator systems and lighting conditions. Thus, improved mechanical strength remains the most direct benefit of filler addition.

17. (B) Silver

Silver is the key metal contributing to amalgam's overall strength and durability. Mercury (A) serves as the liquid metal that reacts chemically with the alloy powders to form the amalgam. Tin (C) and copper (D) provide additional properties—tin aids in setting expansion control and copper enhances corrosion resistance and strength. However, silver is typically the main constituent that imparts the structural integrity. By balancing these metals, manufacturers create an amalgam that can withstand occlusal forces without fracturing prematurely, thus making it suitable for posterior restorations.

18. (B) It helps remove excess mercury

Condensation helps pack the alloy particles together, minimizing voids and expressing surplus mercury to the surface. Removing excess mercury improves the final properties of the amalgam, including strength and corrosion resistance. Color mismatch (A) is largely irrelevant here. Increased setting time (C) is not desired; in fact, proper condensation can facilitate a better set. Polymerization shrinkage (D) is characteristic of resin-based materials, not dental amalgam. Consequently, careful condensation ensures a dense restoration with fewer voids, improved strength, and longer service life for posterior restorations.

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19. (D) They possess lower strength than low copper amalgams

High copper amalgams actually offer higher strength and superior clinical performance than older, low copper formulations. The addition of copper (above 6%) reduces the weak gamma-2 phase, which is primarily associated with tin-mercury, thereby enhancing corrosion resistance (A). By minimizing that phase, the amalgam becomes stronger, more stable, and has better marginal integrity. Thus, the incorrect statement is that high copper amalgams possess lower strength. Their incorporation of copper improves both strength and longevity, making them preferable in modern restorative dentistry.

20. (C) Resin-modified versions require light curing

Resin-modified glass ionomer cements (RMGICs) incorporate a resin component, enabling dual-curing or light-curing capabilities. Conventional glass ionomer cements do not contain this resin component and rely solely on acid-base chemical setting. Both types can release fluoride, so (B) is incorrect. Conventional glass ionomer can chemically bond to dentin (D) through ionic interaction. Hence, the principal distinction is that RMGICs typically offer faster set via light activation, while conventional GICs set more slowly, purely through the acid-base reaction, which can limit working time and final strength development.

21. (C) Resin-modified glass ionomer cement

Resin-modified glass ionomer cement (RMGIC) combines the cariostatic fluoride release of glass ionomer with improved esthetics, strength, and translucency from resin components. Amalgam (A) lacks tooth color and does not release fluoride. Pure acrylic resin (B) is not typically used alone for permanent restorations due to inadequate strength and bonding properties. Gold alloy (D) is strong and biocompatible but not tooth-colored. RMGIC meets the functional and aesthetic requirements for a moderate caries-risk individual who seeks a more natural-looking restoration without sacrificing caries-preventive benefits.

22. (B) Conditioning the tooth surface with polyacrylic acid

Glass ionomer cements chemically bond to tooth structure. Conditioning the surface with a mild polyacrylic acid solution removes the smear layer and enhances ionic bonding between the cement and tooth. Prolonged phosphoric acid etching (A) is more common with composite restorations, and 60 seconds would be too aggressive for GIC placement. Applying a resin bonding agent (C) is not typically necessary for conventional GIC, though it can be used in resin-modified systems. Immediate light curing (D) applies primarily to resin-modified GIC, but only after proper tooth conditioning. Polyacrylic acid priming remains fundamental.

23. (B) Formation of weaker matrix

Excess moisture disrupts the setting reaction in glass ionomer cements, leading to reduced mechanical properties and compromised durability. Early moisture contact dilutes the acid-base reaction, interfering with proper ion crosslinking and leading to a weaker, chalky surface. Decreased working time (A) is not the direct result of moisture contamination; it might hamper technique, but the major impact is structural weakness. It certainly affects final set (C) by impeding proper strength development. Enhanced fluoride release (D) is not a benefit of contamination. Therefore, dryness is crucial during the initial set.

24. (C) Calcium hydroxide liner

Calcium hydroxide liners protect the pulp by forming a secondary dentin bridge and providing a buffering effect on acids. Beneath composites, a thin layer of calcium hydroxide can help reduce postoperative sensitivity, especially in deeper preparations. Zinc oxide eugenol (A) may interfere with composite polymerization due to eugenol's inhibitory effect. Polycarboxylate cement (B) and zinc phosphate (D) can serve as bases or luting agents but lack the same direct pulp-capping benefit and may not alleviate sensitivity as effectively. Calcium hydroxide is commonly the liner of choice for pulp protection under composites.

25. (C) They improve adhesion between tooth and composite

Bonding agents, or adhesives, penetrate the conditioned tooth surface, creating hybrid layers that enable composite resins to bond effectively. This bond enhances retention, decreases microleakage, and helps distribute occlusal forces. Bonding agents do not primarily control color stability (A), which is more related to resin formulation and pigments. They reduce but do not eradicate microleakage (B). Although efficient bonding techniques can streamline placement, the main objective is not to shorten procedure time (D) but to achieve durable, sealed restorations that maintain integrity in the oral environment.

26. (C) Increment thickness exceeding recommended depth

Applying composite increments thicker than the manufacturer's recommended depth can lead to incomplete light penetration and insufficient polymerization at the deeper layers. This results in a weaker restoration and potential post-operative issues. Shorter, appropriate thickness increments (A) combined with adequate curing (B) foster more uniform polymerization. Proper isolation (D) focuses on eliminating moisture contamination but does not directly affect curing depth. Therefore, placing overly thick increments of composite is the step most likely to yield incomplete curing, jeopardizing the restoration's longevity and performance.

27. (B) Lower viscosity in flowable composites

Flowable composites have fewer filler particles, giving them lower viscosity and better adaptability in small or hard-to-reach areas. Packable composites, on the other hand, possess a higher filler load, making them stiffer and better suited for replacing tooth structure in bulk. The lower filler content in flowables typically translates to less strength compared to packables (C). Working time (D) is not necessarily dictated by whether the composite is flowable or packable. Hence, the primary difference is that flowable composites are less viscous and more easily adapted.

28. (D) Reduced polymerization shrinkage

High filler content decreases the volume of resin that undergoes polymerization, thus lessening the overall shrinkage when curing. It also leads to greater compressive strength (opposite of A) and improved wear resistance (opposite of B). Thermal expansion (C) typically decreases with higher filler content because the filler particles generally have a lower coefficient of thermal expansion than the resin matrix. Consequently, adjusting filler loading can control shrinkage and improve mechanical properties, making a heavily filled composite more dimensionally stable and able to withstand occlusal forces.

29. (A) Using a universal self-etch adhesive

A universal self-etch adhesive can tolerate mild moisture better than traditional total-etch systems, reducing the risk of bond failures in challenging isolation scenarios. Skipping etching (B) would lead to weak adhesion. Although choosing amalgam (C) is an alternative, it does not provide the benefits of a tooth-colored restoration or a bonding interface. Heating composite (D) can alter viscosity but does not necessarily solve the fundamental issue of moisture contamination. Self-etching adhesives simplify bonding steps and improve success rates when dryness cannot be perfectly maintained.

30. (C) They absorb some shrinkage stresses

Flowable resin liners with lower filler content can act as stress-absorbing layers, alleviating the stresses generated during polymerization shrinkage of the overlying heavily filled composite. By reducing shrinkage stress at the tooth-restoration interface, such liners help maintain marginal integrity and diminish the risk of microleakage. They do not transmit higher stresses (A) nor do they prevent polymerization (B). Thermal conductivity (D) is unrelated to the liner's main function, which is to buffer stress and enhance adaptation. These characteristics help ensure a more robust, long-lasting posterior restoration.

31. (A) Enhanced polishability

Microfilled composites have very fine filler particles that enable a smoother surface finish and better gloss. This makes them ideal for areas where esthetics are a priority, such as anterior restorations

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or visually prominent surfaces. Their lower filler content, however, can weaken compressive and fracture strength (B, D) compared to hybrid or nanofilled composites. While microfilled composites do contain filler (C), it's not increased; it's actually lower compared to hybrids. Their principal advantage remains high polishability, which produces superior surface smoothness and luster that patients often appreciate.

32. (A) High thermal conductivity

Composites often have a higher thermal conductivity than tooth structure, although not as high as metals. Nonetheless, if no insulating liner or base is used, thermal changes from hot and cold can transmit quickly through the restoration to the dentin and pulp, leading to sensitivity. Low elastic modulus (B) helps reduce stress, not sensitivity. Resin porosity (C) can affect longevity but is not directly responsible for thermal sensitivity. A low coefficient of thermal expansion (D) would actually be beneficial in matching tooth expansion. Thus, insufficient insulation may cause short-term thermal responses.

33. (B) Replace restoration with composite

A fractured Class IV restoration exhibiting discoloration and margin failure indicates compromised bonding and potential infiltration of oral fluids. Polishing (A) merely addresses surface roughness, leaving microleakage and discoloration unresolved. Fluoride varnish (C) aims to prevent caries but cannot fix a failing restoration. A ceramic veneer (D) is more invasive and expensive; it may be indicated if significant aesthetic or structural concerns exist, but typically, redoing the composite is a more conservative solution. Hence, replacing the restoration with a properly bonded composite ensures renewed integrity and esthetics.

34. (D) Better wear resistance

Resin-modified glass ionomer cement (RMGIC) has higher mechanical properties, including superior wear resistance, compared to conventional glass ionomer. This makes it more suitable for areas subject to abrasive forces, like cervical lesions with vigorous brushing. It also retains the fluoride release characteristic for caries prevention. Enhanced modulus of elasticity (A) can be beneficial, but it does not directly address margin wear. Minimal bond strength (B) would be a disadvantage. Increased brittleness (C) is contrary to the improved performance of RMGIC. Therefore, its improved wear resistance is the key advantage.

35. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Modern high-copper amalgams greatly diminish the gamma-2 (tin-mercury) phase, which is weaker and more prone to corrosion. Reducing that phase significantly increases overall strength and durability, making high-copper amalgams superior to older, low-copper types. Thus, the statement that high-copper amalgams are preferred is true, and the explanation that they exhibit reduced gamma-2 phase is directly responsible for their improved clinical performance. Both the assertion and reason are correct and the reason accurately explains why high-copper amalgams have emerged as the preferred material over older formulations.

36. (C) Glass ionomer base

A glass ionomer base provides good thermal insulation due to its relatively low thermal conductivity, while also releasing fluoride to mitigate recurrent caries. Zinc phosphate (A) and polycarboxylate (B) cements can serve as bases but generally do not offer fluoride release. A resin adhesive alone (D) is more associated with composite restorations and does not provide the same thermal insulation benefits. Glass ionomer bases are frequently chosen for amalgam restorations to cushion the pulp from temperature changes, while also adhering to tooth structure and minimizing microleakage.

37. (B) Employ a total-etch and bonding procedure

A proper total-etch technique with phosphoric acid, followed by the application of a bonding agent, significantly reduces microleakage by creating a robust hybrid layer. Bulk placement (A) can lead to excessive shrinkage. Even if enamel is beveled (C), skipping bonding undermines the entire concept of an adhesive restoration. Saliva moisture (D) disrupts bonding effectiveness. Consistent adherence to recommended etching times, careful bonding application, and incremental layering of composite form the bedrock of microleakage prevention. This

ensures a sealed interface, improved longevity, and reduced risk of secondary caries.

38. (D) Prolonged pain with thermal changes

Prolonged sensitivity to hot or cold suggests that fluid movement or bacterial infiltration is occurring at the interface, indicating potential microleakage. Transient sensitivity to sweets (A) or momentary bite discomfort (C) can be short-term phenomena as the restoration settles. Sensitivity that improves over time (B) may be typical post-restoration healing. However, when pain persists or worsens with temperature changes, it suggests an unsealed margin or bond failure, permitting fluid exchange around the restoration. Such symptoms prompt reevaluation of the restoration's seal and potential replacement or repair.

39. (C) Recurrent caries at restoration margin

Recurrent caries at the margin of an amalgam restoration is a sign that the marginal seal has been compromised, allowing bacteria and fluids to penetrate. Tarnish (B) is mainly a surface discoloration and not necessarily indicative of failure. Quick fading sensitivity (A) may be normal for recently placed restorations. A bright shine on the occlusal surface (D) is merely an indication of polishing or normal usage. In contrast, discovering new carious lesions at the interface strongly suggests marginal breakdown, demanding restoration refurbishment or replacement.

40. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Incremental placement helps ensure adequate light penetration for each layer, preventing areas of incomplete curing. Most importantly, placing composite in smaller increments reduces polymerization shrinkage stress, minimizing gap formation at the tooth-restoration interface. Since shrinkage can pull the material away from cavity walls, layering mitigates this effect. Both the assertion and reason align directly: the technique is indicated primarily because smaller increments better control shrinkage and improve final cure. Thus, reason correctly explains why incremental layering is standard practice for most composite restorations.

41. (B) Place a calcium hydroxide liner prior to bonding

When the dentin is deep, a calcium hydroxide liner beneath the composite can protect the pulp by stimulating reparative dentin formation and blocking irritation from resin components. Zinc oxide eugenol (A) can interfere with polymerization of resin-based materials due to residual eugenol. Omitting liners (C) can lead to post-operative sensitivity and potential pulp inflammation. Metallic liners (D) are not typically used with composite restorations. Therefore, applying a thin calcium hydroxide liner is the best strategy, ensuring safe adhesion and minimal risk of pulp harm.

42. (D) Three-body wear test

A three-body wear test simulates chewing dynamics where the material, opposing tooth or restoration, and an intermediate abrasive substance (such as food or artificial media) are in contact. This better replicates real oral conditions. Vickers hardness (A) measures indentation hardness but not comprehensive wear behavior. Compressive strength (B) looks at resistance to force but not surface abrasion over time. Thermocycling with pH cycling (C) examines the impact of temperature and acidity on material stability, yet it does not specifically measure mechanical wear. Thus, a three-body wear test is the standard for evaluating composite wear resistance.

43. (B) Packable composite with incremental layering

A packable composite with incremental layering ensures improved adaptation and control of polymerization shrinkage, especially in large restorations under masticatory stress. Bulk-fill (A) can save time but risks shrinkage stress. Amalgam (C) may be an option but forgoes tooth-colored aesthetic. A no-liner approach (D) may increase sensitivity. By methodically layering and curing each increment, marginal ridges become stronger and less prone to fractures or microleakage. This cautious approach strengthens overall bond integrity and longevity, addressing issues encountered when the previous restoration chipped under functional load.

44. (C) Hybrid composite resin

Hybrid composite resin combines strength and esthetics, making it suitable for occlusal stress-

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bearing areas while providing a tooth-colored finish. Conventional composites (A) often lack sufficient filler content for heavy load scenarios, while high-copper amalgam (B) offers excellent strength but no esthetic benefit. Glass ionomer (D) has fluoride release but lacks the durability demanded by heavy occlusal forces. A hybrid composite balances robust filler loading with adequate polishability, delivering both durability and an acceptable appearance in posterior teeth when properly placed and bonded.

45. (C) Use a compatible liner or base and proper bonding

Placing a pulp-protective liner (e.g., calcium hydroxide) or base (e.g., glass ionomer) under a deep restoration helps absorb some stresses and shield the pulp from thermal and chemical irritants. Proper bonding techniques seal dentinal tubules, preventing fluid movement and bacterial ingress. Omitting bonding (A) would lead to poor retention and likely sensitivity. Bulk-filling large cavities (B) increases shrinkage stress. Shortening curing times (D) risks inadequate polymerization. Thus, a methodical approach that includes a suitable liner/base plus careful bonding is key to minimizing sensitivity in deep restorations.

46. (B) Special photoinitiators allowing deeper curing

Bulk-fill composites are formulated with modified resin chemistry and specialized photoinitiators that enable more uniform light penetration, permitting layering depths up to 4-5 mm. This reduces the number of increments needed and can decrease polymerization shrinkage stress if used according to instructions. Merely increasing filler content (A) is insufficient on its own. The matrix resin (C) is still present, albeit optimized. Immediate finishing and polishing (D) is typically recommended after complete curing but doesn't directly minimize shrinkage. The advanced photoinitiators are the defining innovation in bulk-fill composites.

47. (A) Glass ionomer

Glass ionomer bases have lower thermal conductivity, protecting pulp from temperature fluctuations. They also release fluoride, enhancing caries resistance. Zinc oxide eugenol (B) can inhibit resin polymerization. Resin cement (C) is primarily for luting indirect restorations. Polyurethane (D) is not a conventional dental base material. Given near-pulpal proximity, glass ionomer offers thermal insulation, chemical bonding, and suitable strength. It is typically placed before the final adhesive application for a composite restoration, providing a protective layer to the dentin-pulp complex and supporting patient comfort.

48. (B) Glass ionomer cement

Glass ionomer cement adheres to tooth structure even under less-than-ideal moisture conditions, making it a good option for pediatric restorative treatments. It also releases fluoride, which helps prevent secondary caries. Composite resin (A) is technique-sensitive regarding moisture control. Zinc phosphate (C) is primarily a luting agent with no fluoride release. Amalgam (D) offers durability but lacks fluoride release and esthetic appeal. Thus, glass ionomer is most suitable here due to its moisture compatibility and cariostatic benefits, especially beneficial for pediatric patients where isolation can be challenging.

49. (A) Over-conditioning with polyacrylic acid

Excessive or overly aggressive conditioning can weaken the surface layer of the tooth and disrupt the acid-base reaction, potentially limiting fluoride retention and release. While a proper mixing ratio (B) is crucial for setting and strength, it's not the main cause of decreased fluoride release if done correctly. Using a varnish after initial set (C) can help protect the restoration but does not significantly reduce fluoride release. Incremental placement (D) is not typically used for GIC. Hence, over-conditioning can negatively affect the final material's fluoride-release capacity.

50. (C) Hybrid composite

Hybrid composites combine the aesthetic appeal of resin with sufficient filler content for improved strength, making them suitable for posterior restorations under moderate to heavy occlusal loads. While regular glass ionomer (A) offers fluoride release, it typically lacks the mechanical robustness needed in high-stress areas. An amalgam core with a full crown (B) might be stronger but is more expensive and invasive, losing tooth structure. Gold inlays (D) are highly durable but fail the patient's demand for improved esthetics. A carefully placed

hybrid composite fulfills both strength and cosmetic needs.

51. (B) Impression

An impression is the negative form capturing the details of a patient's teeth and surrounding oral tissues, which is subsequently filled with a gypsum product or other material to create a positive replica (cast or model). In contrast, a cast (A) is the resulting three-dimensional reproduction. An articulator (C) is a mechanical device that simulates jaw movements for mounting casts, and a die (D) typically refers to a single-tooth replica. Impression materials must accurately record fine detail and be stable enough to maintain fidelity during removal and subsequent pouring, ensuring precise prostheses or restorations.

52. (B) Potassium alginate

Potassium alginate is derived from seaweed and represents the key component that reacts in the presence of calcium ions (commonly supplied by calcium sulfate) to form an insoluble calcium alginate gel. Silicon dioxide (A) increases the mix's body, while borax (D) can extend working time or modify set properties. Calcium sulfate dihydrate (C) facilitates the cross-linking reaction, but alginate itself (potassium alginate) is what primarily creates the hydrocolloid matrix. Once the gel sets, it locks in the negative imprint of the oral tissues, rendering a detailed impression.

53. (C) It leads to water loss and dimensional changes

Syneresis refers to the phenomenon where a set hydrocolloid impression material, such as alginate, loses water over time, causing dimensional shrinkage and distortion. This loss of fluid from the gel structure compromises the accuracy of the impression, potentially yielding an ill-fitting final restoration. Conversely, imbibition (B) occurs if the impression is placed in water, and the material takes up water, swelling and distorting. Rigidity (A) and tear resistance (D) are distinct properties not directly improved by syneresis. Proper handling, timely pouring, and correct storage (e.g., in a humid environment) reduce syneresis-related distortions.

54. (B) Highly accurate detail reproduction for crown margins

Alginate is user-friendly, relatively inexpensive, and comfortable for patients. It sets quickly (advantageous in many situations) and does not require highly specialized equipment. However, it is not recommended for impressions demanding extremely fine detail—such as crown and bridge margins—because of its relatively low tear strength and limited detail reproduction. More precise elastomeric materials (e.g., polyvinyl siloxane) are better suited for detailed crown preparations. Thus, while alginate works well for study models or preliminary impressions, it is not ideal for capturing the critical margins needed in sophisticated prosthetic restorations.

55. (C) They usually have superior tear strength and accuracy

Elastomeric materials such as polyvinyl siloxane (PVS) or polyether have higher tear strength and can reproduce fine details more reliably than hydrocolloids, making them popular for fixed prosthodontics. Moreover, they typically exhibit excellent dimensional stability, allowing for delayed pouring without significant distortion, unlike hydrocolloids (which need prompt casting). Elastomeric materials can definitely be used for crowns and bridges (B), and their stability means they do not always need immediate pouring (D). Hence, their enhanced tear resistance and detail reproduction set them apart from hydrocolloid impressions, which are more technique-sensitive regarding storage and pouring.

56. (B) Polyvinyl siloxane (PVS)

Polyvinyl siloxane offers excellent dimensional stability, high tear strength, and superb detail reproduction, making it the go-to choice for complex fixed prostheses. Alginate (A) lacks the precision and dimensional stability required for multiple-unit crowns or bridges. Impression compound (C) is generally used for border molding in denture cases and not indicated for detailed tooth preparations. Inelastic plaster (D) is seldom used nowadays because it cannot flex out of undercuts without fracturing, rendering it unsuitable for detailed, multi-tooth scenarios. Thus, PVS stands out for reliably capturing minute details over extended arch spans.

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57. (C) Polysulfide rubber

Polysulfide rubber, an elastomeric material, exhibits excellent flexibility and tear strength, allowing it to record undercuts and intricate surface details while still being removable without significant tearing. Plaster of Paris (A) is inelastic and will fracture in undercut areas. Zinc oxide eugenol (B) is also inelastic and primarily used for edentulous impressions. Impression compound (D) becomes rigid upon cooling and generally suits border molding or preliminary impressions, not detailed undercut registration. Although polysulfide has fallen out of favor due to odor and handling inconveniences, it remains a good choice for deep undercuts.

58. (B) Recovery from deformation

Recovery from deformation indicates an impression material's capacity to rebound to its initial shape after being stretched or compressed during tray removal. High recovery from deformation is essential to preserve accuracy, especially in the presence of undercuts or tight interdental spaces. Working time (A) signifies the time available to manipulate the material. Flow rate (C) measures viscosity changes during application. Wettability (D) reflects how well the impression material can spread over moist oral tissues. Elastomeric materials, such as addition silicones and polyethers, are prized for their high elastic recovery, yielding more precise impressions.

59. (B) Polysulfide

Polysulfide rubber impression material is recognized by its characteristic "rubber" or sulfur-like odor and its need for a custom tray to limit bulk, ensuring more controlled thickness and reducing distortion. Polyether (A) has a slight odor but is not typically described as sulfur-like. Addition silicone (C), also known as polyvinyl siloxane, tends to be more neutral in odor. Reversible hydrocolloid (D) is odorless and relies on thermal changes for setting, not chemical polymerization. Polysulfide's relatively high flow, good tear resistance, and elasticity once set explain why custom trays are strongly recommended.

60. (C) Polyether is dimensionally rigid and requires a tray with uniform spacing

Polyether impression material is known for its stiffness once set, offering less flex than many other elastomers. If the tray does not maintain consistent spacing across the arch, uneven pressure can distort the material, compromising accuracy. A custom tray or well-fitting stock tray ensures the material thickness remains uniform, reducing the risk of tray "locking in" or undercut interference. Allergic reactions (A) are more related to patient sensitivities, and setting time (B) is unaffected by tray composition. Stock trays do not inherently contaminate the material (D), but inadequate adaptation can lead to distortions or incomplete impressions.

61. (C) Vigorously shaking the tray after material loading

Vigorously shaking the filled tray can incorporate air pockets and disrupt the smooth layer of impression material, causing voids. Proper isolation (A) reduces moisture that traps air bubbles. Injecting a thin layer of the lower viscosity wash (B) around sulcus or margin areas eliminates air entrapment in critical regions. Seating the tray slowly and consistently (D) ensures material flows around teeth before setting. Rapid or shaky placement fosters turbulence, introducing bubbles. Hence, stillness and careful tray seating, combined with a controlled approach to wash and tray material, maximize impression accuracy.

62. (C) Reversible hydrocolloids change from sol to gel upon cooling

Reversible hydrocolloids, such as agar, transform from a sol (liquid-like state) to a gel (solid-like state) primarily through temperature manipulation. They liquefy with heat and gel when cooled. Irreversible hydrocolloids, like alginate, undergo a chemical reaction that permanently locks them into the gel phase and cannot revert to the liquid state. Thus, they set chemically rather than thermally. Agar-based impressions can be reheated and reused, whereas once alginate sets, it is permanently "fixed." Clinically, agar's reversible feature offers good detail reproduction but demands specialized water baths and quick use.

63. (B) Double-cord retraction with polyvinyl siloxane

When margins lie subgingivally, adequate soft tissue management is crucial to expose the prepared tooth boundary. Placing two retraction cords (one deeper, one more superficial) opens the sulcus, allowing impression material to flow accurately around margins. Polyvinyl siloxane (PVS) is known for its fine detail capture, good flow, and excellent dimensional stability, facilitating precise recording of these challenging areas. Alginate (A) lacks detail fidelity, and impression compound (C) doesn't reliably capture subgingival details. Non-eugenol paste alone (D) does not necessarily provide the fine detail or retraction needed for accurate subgingival impressions.

64. (C) Good tissue tolerance and detail reproduction

For a mobile, edentulous ridge, the impression material must accurately record tissue position without exerting undue force. Good tissue tolerance ensures minimal distortion of delicate mucosa, while fine detail reproduction helps capture critical anatomical landmarks. A highly rigid material (A) risks displacing or compressing tissues, yielding inaccurate results. Long setting times (B) can be uncomfortable and lead to tissue compression or movement. Excessive hydrophobicity (D) hinders adaptation to moist oral structures. Materials like polyether or mucostatic impression techniques with minimal pressure can meet these requirements, offering a stable and accurate final denture.

65. (C) Prolonged delay in pouring the impression

Because reversible hydrocolloid (agar) is highly sensitive to moisture changes and syneresis, extended delay before pouring can cause dimension shifts. Immediate or prompt pouring preserves the impression's accuracy. Proper storage in a humid environment (A) helps minimize water loss. Maintaining exact water bath temperatures (B) ensures controlled phase transitions from sol (at higher temperature) to gel (at lower temperature). Rapid cooling (D) is standard protocol for agar, aiding in a precise transformation without undue distortion. If left too long, agar impressions can dehydrate or distort, diminishing their value for final restorations.

66. (C) Potential shrinkage or distortion

Even though elastomeric materials (e.g., PVS) generally have superior dimensional stability compared to hydrocolloids, exposure to high temperatures and extremely dry conditions over an extended period can lead to slight evaporation of volatile components or chemical degradation. This results in dimension change, albeit less drastically than for hydrocolloids. They do not gain tear resistance (D) or accuracy (A) from improper storage, and to say there is "no change in properties" (B) disregards potential environmental effects. Hence, correct storage conditions are recommended to preserve maximum stability until pouring.

67. (B) Greater affinity for water, improving flow around wet tissues

Hydrophilic materials spread easily over moist tissues, reducing voids and enhancing detail capture in subgingival or hard-to-dry areas. Polyether's inherent hydrophilicity means it readily adapts, improving surface contact and lowering the incidence of air entrapment around the gum line. This property helps clinicians manage challenging conditions like slight bleeding or saliva presence. In contrast, hydrophobic materials repel moisture, potentially trapping bubbles. Although polyether has good detail reproduction, it does not specifically boast faster set in dryness (C) nor does it inherently exhibit high polymerization shrinkage (D). Its defining effect is better adaptation in moisture.

68. (B) Addition silicone (PVS)

Addition silicone, commonly called polyvinyl siloxane, stands out for its near-zero polymerization shrinkage, excellent dimensional stability, and capacity to capture fine details. This stability allows for a delay in pouring if needed, without compromising accuracy—vital for multi-unit cases. Condensation silicone (A) loses accuracy over time because of by-products like ethanol. Alginate hydrocolloid (C) lacks sufficient detail for subgingival crown margins and requires immediate pouring. Compound (D) is used mostly as a border-molding or preliminary impression material for dentures, rather than for elaborate crown preparations. Consequently, PVS remains the gold standard for such complex restorative demands.

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69. (B) Air entrapment from improper syringe/tray material blending

When the syringe (wash) material and tray (heavy-body) material are not smoothly joined or if the dentist fails to maintain continuous flow, air can be trapped at the margin of convergence. The resulting cast can show bubbles or voids near critical areas. Thorough syringe application (A) typically avoids voids. Monophase techniques (C) can work well if used properly with uniform material. Delayed pouring (D) in stable elastomers usually does not directly cause internal voids, unless extremely prolonged. Hence, the culprit is frequently an improper interface between different viscosities, leading to air bubbles.

70. (C) Place gingival retraction cord and isolate thoroughly

Tears at the margin often result from inadequate exposure or dryness of subgingival areas. By placing retraction cord, the dentist creates space between the gingiva and tooth margin, enhancing the flow of impression material and reducing the risk of tearing. Merely increasing tray size (A) doesn't address subgingival detail. Using a stiffer material (B) might actually exacerbate tearing if tissues are not properly retracted. Reducing setting time (D) might shorten the working period but will not solve the fundamental issue of insufficient tissue retraction. Thorough isolation is vital for a precise margin record.

71. (B) Cementation

Cementation is the act of seating and sealing a restoration (such as a crown or inlay) onto the prepared tooth using a luting agent (cement). Acid-etching (A) is used primarily in resin bonding, especially with composite restorations or porcelain veneers. Cohesion (C) refers to the internal attraction of molecules within the same substance. Sintering (D) is a manufacturing process (usually for ceramics or metals) where particles fuse under heat. In dentistry, cementation involves properly mixing and placing a luting material that provides mechanical and/or chemical retention between the tooth preparation and prosthesis.

72. (A) Zinc phosphate cement

Zinc phosphate cement's acid-base reaction liberates heat, making it critical for the dental operator to mix it on a cool glass slab to dissipate heat, prolong working time, and maintain optimal properties. Zinc polycarboxylate (B) also sets by an acid-base reaction but produces significantly less heat. Glass ionomer cement (C) can warm slightly but is not renowned for a strongly exothermic reaction. Resin cements (D) cure through chemical or light polymerization rather than primarily acid-base interaction. With zinc phosphate, controlling temperature during mixing is paramount to avoid premature set and enhance consistency.

73. (C) It chemically bonds to tooth structure, reducing microleakage

Zinc polycarboxylate cement can chelate with calcium in tooth structure, creating a more intimate seal that diminishes microleakage and reduces sensitivity. This property helps protect exposed dentin from external stimuli. Zinc phosphate is more acidic initially and lacks a chemical bond, potentially increasing the risk of postoperative sensitivity. Eugenol (B) is present in zinc oxide eugenol cements, not polycarboxylate. A highly acidic pH (A) generally irritates pulp rather than soothing it, and zinc polycarboxylate is not known for an intense exothermic reaction (D). Its primary advantage lies in adhesion and biocompatibility.

74. (D) Extremely high compressive strength matching amalgam

While glass ionomer luting cement is admired for chemical bonding to the tooth and fluoride release—attributes promoting retention and inhibiting recurrent decay—it does not possess compressive strength equivalent to metallic restorations like amalgam. Compared to many other cements, its compressive strength is moderate, suitable for standard crowns but not at the same level as high-strength restorative materials. Glass ionomer also tolerates mildly moist fields better than certain resin cements, though dryness is still recommended. Thus, while it offers numerous benefits, matching amalgam's compressive strength is not one of them.

75. (C) Resin cements often demonstrate higher strength and lower solubility

Resin cements typically feature superior mechanical strength, reduced solubility, and better bonding potential (especially when used with appropriate adhesive systems) than traditional water-based cements. They are not water-based (B), relying on resin polymers that polymerize chemically or via light activation. Many resin cements can chemically or micromechanically bond to tooth structure (A) when combined with an appropriate bonding protocol. Their setting reaction is polymerization, not the primarily acid-base exothermic reaction of zinc phosphate (D), though some heat is generated during polymerization. This combination of strength and low solubility favors resin cements for definitive prostheses.

76. (D) Adhesive resin cement

All-ceramic restorations often rely on bonding to achieve retention, especially when tooth preparation has limited mechanical resistance. Adhesive resin cements (with proper etching and silanation of the ceramic) provide robust chemical and micromechanical bonds to both tooth structure and the ceramic, ensuring a durable interface. Zinc polycarboxylate (A) and glass ionomer (C) have lower bond strengths for ceramic, while resin-modified glass ionomer (B) can be used under certain circumstances but doesn't achieve the same bond quality as a specialized adhesive resin system. Therefore, an adhesive resin cement is optimal for minimal retention scenarios.

77. (C) Fluoride release with acceptable strength

Resin-modified glass ionomer cement releases fluoride, aiding in caries prevention, and exhibits improved mechanical properties over conventional glass ionomer. This makes it suitable for cementation of porcelain-fused-to-metal (PFM) crowns, which require moderate strength to retain the restoration and resist occlusal forces. Eugenol (A) is not a trait of RMGIC and can inhibit resin polymerization if present. RMGIC typically sets by a dual mechanism (acid-base reaction plus resin polymerization), not solely light-cure (B). It can bond adequately to tooth structure—though not directly to metal in the same manner—and does not rely on "inability" (D).

78. (B) Acid-base reaction

The setting of zinc polycarboxylate cement involves the acid (polyacrylic) reacting chemically with zinc oxide powder to form a salt matrix that binds the powder particles and adheres to the tooth. This fundamentally qualifies as an acid-base reaction. Hydration (A) refers to the incorporation of water molecules. Oxidation (C) involves electron loss and is not the mechanism behind zinc polycarboxylate's setting. Addition polymerization (D) describes how resin-based materials cure. Hence, zinc polycarboxylate cement's formation of a cohesive matrix by acid-base neutralization underscores its ability to bond chemically with tooth structure.

79. (A) Zinc oxide eugenol cement

Zinc oxide eugenol (ZOE) cement is formulated from zinc oxide powder and eugenol-containing liquid. Eugenol has a sedative effect on the pulp, often used as a temporary restorative or base material in deep cavities. Polycarboxylate cement (B), glass ionomer (C), and resin cements (D) have different compositions. Glass ionomer employs polyalkenoic acid and ion-leachable glass, polycarboxylate uses polyacrylic acid, and resin cements rely on resin-based monomers. The distinct palliative property of ZOE arises from eugenol, which can help reduce discomfort in the short term but may inhibit resin polymerization if used beneath composites.

80. (C) Eugenol can inhibit the resin polymerization

Eugenol interferes with the polymerization of resin monomers, leading to incomplete curing and compromised bonding for composite restorations. As a result, restorations placed over ZOE bases can exhibit weak interfaces and increased marginal leakage. While ZOE may provide sedation for the pulp and is suitable for temporary uses, it is generally avoided under permanent composite fillings. Its compressive strength (A) isn't an inhibiting factor; it does not typically stain composites permanently (B). Although the initial pH can be slightly acidic, (D) is not the main problem—resin inhibition from eugenol is the critical issue.

81. (B) Restoring Class I high-stress cavities in posterior teeth

Glass ionomer cement is widely employed for luting (A) and for restorations in non-load bearing

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areas like cervical lesions (D). It is also suitable as a liner or base under composites (C) due to fluoride release and chemical adhesion. However, placing conventional glass ionomer in high-stress Class I cavities (B) is generally not recommended because it lacks sufficient mechanical strength and wear resistance to endure occlusal forces over time. In high-load posterior regions, stronger restorative materials (e.g., resin composites, amalgam, or more advanced glass ionomer modifications) are often indicated to ensure durability.

82. (C) Resin-modified versions require a photo-initiated or dual cure

Resin-modified glass ionomer cements (RMGIC) retain the glass ionomer's acid-base reaction yet incorporate resin monomers, enabling light or dual curing. This provides faster set, greater strength, and improved moisture tolerance. Both conventional and resin-modified glass ionomer can release fluoride (A), though RMGIC may release slightly less than conventional versions. Additionally, both can chemically bond to tooth structure (D) through ionic interaction. RMGIC's enhanced properties come from the combination of acid-base chemistry and resin polymerization, making them more stable in early moisture exposure than purely acid-base (conventional) cements, which can be sensitive during set.

83. (B) Application of silane to porcelain and resin cement

For bonding a porcelain inlay, silanation is essential to create a chemical bond between the silica in the ceramic and the resin cement. The porcelain surface is usually etched with hydrofluoric acid, then silane coupling agent is applied. Resin cement is subsequently used to form a strong interface with both the porcelain and the tooth (the tooth side may require an adhesive system). Zinc phosphate (A) does not chemically bond to ceramic. Glass ionomer (C) bonds well to tooth structure but not strongly to porcelain. Omission of etching (D) dramatically weakens the porcelain-cement interface.

84. (B) Low film thickness for intimate fit

A cast post and core relies on a precise fit and strong retention in the canal. Low film thickness helps the cement fully adapt between the metal post and the canal walls, reducing voids and improving retention. Slow setting (A) is not a priority once the post is properly seated; typically, you want a controlled but not overly prolonged set. Excessive solubility (C) is detrimental, leading to failure over time. High translucency (D) is mainly important in ceramic restorations. Maintaining a thin film layer ensures the post seats deeply and remains stable under load.

85. (C) Rapidly blending all powder at once, generating heat

Zinc phosphate cement is exothermic. The standard method is to gradually incorporate powder into the liquid on a cooled glass slab, slowing the reaction and allowing heat to dissipate. If the operator dumps all the powder at once and mixes vigorously, internal heat spikes, shortening working time and risking incomplete integration. This results in a grainy or prematurely set cement with compromised strength. Using a cooled slab (A), incremental powder addition (B), and spreading the mix (D) all help control the exothermic reaction, ensuring a uniform, high-strength final cement mixture.

86. (C) Lower degree of conversion leading to weaker cement

If the light-curing step is inadequate, the cement's polymer network may remain partially formed, reducing mechanical strength, bond durability, and color stability. Dual-cure systems include a chemical catalyst to help cure in deeper or shaded areas but still benefit significantly from proper light exposure. When polymerization remains incomplete, the final restoration-luting interface becomes less robust, raising the risk of microleakage or debonding. Consequently, failing to cure thoroughly does not yield improved properties (A) or a faster set time (D). The actual result is an undercured, weaker cement structure susceptible to failure.

87. (B) Porous matrix and reduced strength

Resin-modified glass ionomer cements still rely on partial acid-base chemistry, so excessive moisture before final set can dilute components and interfere with ionic cross-linking, causing a weaker, more porous matrix. This leads to compromised mechanical properties and potential marginal breakdown. Contamination does not improve adhesion (A). It can actually accelerate or disrupt

the set, not necessarily prolong it beneficially (C). High compressive strength (D) is a characteristic of well-cured RMGIC without contamination. Hence, dryness throughout the initial set is crucial to ensure optimum physical properties and long-lasting restoration success.

88. (C) Resin cement

Bruxism imposes substantial loads on crowns, demanding a cement with high strength and minimal solubility to prevent washout or early failure. Resin cements best fulfill this requirement by forming robust chemical bonds (especially when used with bonding agents) and demonstrating low dissolution in oral fluids. Conventional glass ionomer (A) has moderate strength but is not as resistant to solubility. Zinc oxide eugenol (B) is typically for provisional cementation and is not strong enough for bruxers. Zinc phosphate (D) is strong but more soluble than resin cements over the long term, making resin cements the superior choice.

89. (C) Zinc phosphate

Zinc phosphate cement primarily depends on mechanical retention with the tooth and restoration. It does not chemically bond to enamel or dentin, leaving a higher chance of marginal gaps over time. Polycarboxylate (B) and resin-modified glass ionomer (A) can form chemical bonds, and adhesive resin (D) cements bond micromechanically and/or chemically, helping reduce microleakage. Though proper crown preparation and adaptation are also vital, the lack of a reliable adhesive interface with zinc phosphate can contribute to increased microleakage or marginal staining, especially if the restoration's fit is not optimal.

90. (C) Total-etch with resin cement and silanation of the veneer

Ceramic veneers rely heavily on bonding to tooth structure for retention. A total-etch technique (phosphoric acid on tooth structure) creates micro-porosities in enamel and any exposed dentin, facilitating resin infiltration. Simultaneously, silanating the veneer's internal surface fosters strong chemical bonding between ceramic and resin cement. Glass ionomer (A) or zinc oxide eugenol (B) do not provide high bond strength. Zinc phosphate (D) only offers mechanical retention and is unsuited for thin veneers where bonding is paramount. Thus, a bonding protocol with adhesive resin cement and appropriate pretreatment ensures the veneer securely adheres long-term.

91. (C) Etching the internal inlay surface and applying a coupling agent

Proper surface treatment of the indirect restoration is essential for successful bonding. When dealing with composite inlays, gently roughening or etching the internal surface (commonly with hydrofluoric acid if the material is ceramic or microetching if it is composite) and applying a silane or specialized coupling agent fosters strong chemical bonds to resin cements. Merely cleaning with pumice (B) is not enough to create a robust bond. Gypsum model pouring (A) concerns laboratory procedures, not cementation. Cooling the cement (D) is more relevant to certain acid-base cements to control working time, not resin cements.

92. (B) Radiographic evidence of washout or gap beneath the crown margin

When cement dissolves or disintegrates, fluid and bacteria can penetrate beneath the crown margin, often visible as a radiolucent gap on radiographs. This infiltration leads to localized gingival inflammation, possible secondary decay, and crown failure. Healthy visual margins (C) and no sensitivity (D) do not rule out margin breakdown, but an obvious washout (B) strongly suggests compromised cement. Reddened papillae alone (A) might be mild gingivitis unrelated to margin failure. Thus, a radiographic gap or shadow beneath the crown is a definitive red flag for cement breakdown and potential restoration failure.

93. (B) Brownish discoloration at the crown margin

A subtle brownish or grayish stain at the margin often indicates that fluids, debris, or bacteria have seeped between the restoration and tooth interface—classic evidence of microleakage. Crown mobility within a week (A) would point to major retention failure, not typical microleakage. A complete fracture (C) might reflect excessive occlusal forces or structural faults. Immediate severe pain on biting (D) soon after cementation might be high occlusion or pulpitis. A slow-developing margin discoloration (B) is

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more characteristic of ongoing leakage, eventually compromising both the tooth and the crown.

94. (B) Both Assertion and Reason are true, but Reason is not the correct explanation.

Resin cements often come in various shades or translucencies, allowing dentists to optimize the esthetic outcome under ceramic restorations like veneers. This supports the assertion that they can be color-matched. While these cements do contain filler particles that can modify properties (including controlling setting characteristics or shrinkage), this is not the direct explanation for why they are color-matchable. The reason focuses on exothermic reaction moderation via fillers, which helps manage polymerization. Color matching stems primarily from the inclusion of specific pigments and opacifiers. Thus, both statements are true, yet the reason does not explain the assertion.

95. (A) Sandblasting or etching the internal ceramic surface and using resin cement

Bond strength to porcelain is significantly enhanced by roughening or etching the surface, typically with hydrofluoric acid or airborne particle abrasion (sandblasting), followed by a silane coupling agent. Then a resin cement can form a robust micromechanical and chemical bond. Merely changing the vertical dimension (B) does not solve crown retention issues. Zinc oxide eugenol (C) is a temporary cement and unsuitable for permanent retention. Leaving porcelain unconditioned (D) typically fails to provide an adequate bond. Proper surface treatment ensures the crown's internal surface and the chosen cement interface with stronger adhesion.

96. (C) Microtensile bond strength test

Microtensile bond strength testing measures the force required to break the bond between a cement and tooth or restorative material. This closely mirrors actual clinical retention demands, especially under tensile and shear forces in the mouth. Film thickness (A) is relevant for seating but not a direct measure of bond durability. Compressive strength (B) looks at material strength but doesn't necessarily reflect how well the cement adheres. Solubility (D) indicates stability in oral fluids but does not directly assess bond integrity. Thus, microtensile bond strength best represents long-term retention potential.

97. (B) Silane application after hydrofluoric acid etch

Lithium disilicate (E-max) restorations gain significant bond enhancement when their internal surfaces are etched with hydrofluoric acid to create micro-retentive areas. Applying a silane coupling agent afterwards chemically links the silica in the glass-ceramic to the resin cement. Phosphoric acid (A) alone is insufficient to etch lithium disilicate effectively. Zinc phosphate (C) does not bond chemically to ceramic. Omitting internal surface treatment (D) leaves the surface too smooth to achieve robust retention. Therefore, the key is combining hydrofluoric acid etching with silanation so the resin cement can establish a strong, durable bond.

98. (A) Non-eugenol zinc oxide

Eugenol in zinc oxide cements can interfere with the polymerization of resin-based cements, weakening the final bond. Switching to a non-eugenol zinc oxide formula allows stronger temporary retention without risking residual eugenol contamination that disrupts final bonding. Polycarboxylate (B) and glass ionomer (C) might be overly retentive as temporaries, sometimes making crown removal difficult. Resin-modified glass ionomer (D) can also complicate final bonding due to partial bonding to tooth surfaces. Non-eugenol zinc oxide offers adequate retention and simpler cleanup, leaving minimal residue to compromise subsequent adhesive resin cementation.

99. (C) Adhesive resin cement

A short or tapered abutment reduces mechanical retention, making a strong bond indispensable. Adhesive resin cement, used alongside appropriate bonding protocols (etching dentin, possibly roughening metal or porcelain surfaces), offers a robust, stable interface. This is especially crucial under heavy occlusal forces from bruxism. Zinc phosphate (A) only provides mechanical retention. Polycarboxylate (B) chemically bonds to tooth but has limited strength compared to resin cements. Conventional glass ionomer (D) also lacks the same bond strength and is more soluble. Consequently,

resin cements help secure the restoration and withstand high functional loads effectively.

100. (D) Self-adhesive resin cement

With minimal ferrule and short tooth height, a robust bond is critical to counter dislodging forces. Self-adhesive resin cements bond chemically and micromechanically to both tooth structure and zirconia without requiring a separate primer in many cases. While conventional glass ionomer (A) is simpler, it lacks the same adhesive capability and is more prone to dissolution. Zinc oxide eugenol (B) is purely temporary, never ideal for long-term retention. Resin-modified glass ionomer (C) offers intermediate bond strength but may not suffice under high stress. Self-adhesive resin cement provides enhanced retention, minimal technique sensitivity, and superior clinical longevity.

101. (B) Noble metal

Noble metals have a high resistance to oxidation, tarnish, and corrosion. In dentistry, gold, palladium, and platinum are the primary noble metals used in casting alloys. These metals retain their properties in hostile oral conditions, prolonging restoration longevity. Base metals (A) like nickel, chromium, or cobalt corrode more readily if not passivated. Reactive metals (C) tend to oxidize quickly in air unless protected, making them less stable in the mouth. "Allotropic metal" (D) refers to a substance that can exist in different crystalline forms but does not describe corrosion resistance. Nobility ensures biocompatibility and durability.

102. (C) Ruthenium

Small additions of elements like ruthenium, iridium, or rhenium to high-gold dental alloys produce a grain-refining effect, making the internal structure more uniform and enhancing mechanical performance. By controlling grain size, the alloy resists deformation and maintains strength for cast restorations under occlusal loads. Iron (A) is not commonly added for grain refinement in gold alloys. Copper (B) increases strength and hardness, especially in lower-gold or gold-based alloys, but it doesn't serve the same precise grain-refining role. Zinc (D) mainly acts as an oxygen scavenger to improve casting. Ruthenium is the prototypical grain refiner in many gold alloys.

103. (B) It produces a protective oxide layer that resists corrosion

Base metal alloys, such as those containing chromium or titanium, rely on passivation for in-mouth stability. The alloying elements react with oxygen, forming a thin, stable oxide film that inhibits further oxidation or corrosion. This self-limiting layer is why stainless steel or cobalt-chromium frameworks endure in the moist, acidic oral environment. Lowering the melting range (A) is unrelated to passivation; it depends on alloy composition. Increasing thermal expansion (C) would be undesirable for fit. A glossy surface (D) is a finishing process, not a result of passivation. The oxide layer is fundamental for corrosion resistance.

104. (C) Low melting temperature

Cobalt-chromium alloys have a relatively high melting temperature, which is one reason they require specialized casting equipment and techniques in the dental laboratory. They exhibit excellent strength (A) and can be made in thin cross-sections (lightweight) without compromising rigidity (B). The presence of chromium confers corrosion resistance through a stable chromium oxide film (D). A low melting point, on the other hand, is associated with metals like lead or solder alloys, not with cobalt-chromium. Their high fusion range demands precise temperature control during casting to ensure accurate partial denture frameworks with minimal defects.

105. (C) High noble alloys generally have better biocompatibility and tarnish resistance

High noble alloys usually contain significant quantities of gold, platinum, or palladium—metals that resist corrosion and maintain oral biocompatibility. Consequently, they are less prone to tarnish and galvanic interactions. In contrast, predominantly base metal alloys can achieve high strength and hardness but often rely on protective passive oxide layers (like chromium oxide) to ward off corrosion. They do not typically include large gold percentages (B). High noble alloys are more stable and well-tolerated biologically (C). Base metals frequently exhibit higher yield strength (D), enabling thinner sections, while high noble alloys excel in long-term chemical inertness.

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106. (B) Avoiding nickel and beryllium

Allergies to metals such as nickel and beryllium are among the more common metal sensitivities in dentistry. Therefore, ensuring the chosen gold alloy does not contain these elements reduces the risk of adverse tissue reactions or systemic hypersensitivity. High copper content (A) can modify mechanical properties but doesn't address allergy risk. Type IV gold (C) is strong, but it still must be free of allergenic base metals. Lead-containing solder (D) introduces toxicity concerns. The priority is to eliminate known allergenic and toxic constituents, with nickel and beryllium typically being top concerns.

107. (C) High ductility and springiness

Clasp arms on removable partial dentures must flex over an abutment's survey line and then return to their original shape without permanent deformation. Such performance necessitates high ductility and resilience ("springiness") so that the clasp can engage undercuts effectively yet withstand repeated insertion and removal. A high modulus of elasticity (A) would make the clasp too rigid to flex. Low yield strength (B) might cause permanent bending under normal forces. Passivation (D) helps corrosion resistance but does not ensure flexibility. Hence, an alloy with sufficient ductility and resilience is ideal for clasp construction.

108. (C) Chromium

Stainless steel's corrosion resistance is primarily due to chromium. This element forms a thin, stable chromium oxide layer on the metal surface, which prevents further oxidation and metal degradation. Nickel (A) can increase toughness or ductility but does not drive passivation. Zinc (B) is less common in stainless steel formulations and typically used elsewhere as an anti-oxidant or galvanizing layer. Carbon (D) adds hardness but does not provide corrosion protection. The protective chromium oxide film, if intact, allows stainless steel dental instruments to endure repeated sterilization cycles and chemical exposures without significant rust formation.

109. (B) Allowing the alloy to overheat extensively

Excessive temperature beyond recommended limits can oxidize or degrade alloy constituents, leading to inclusion defects and rough grain structures in cobalt-chromium frameworks. This can weaken the framework, reduce ductility, and even compromise corrosion resistance. Using a high-heat investment (A) may be appropriate depending on the alloy's melting range. Strictly following temperature protocols (C) ensures the metal liquefies sufficiently for casting without destroying critical elements. Controlled cooling (D) prevents rapid contraction stresses and microfractures. Overheating remains the most damaging step, because cobalt-chromium depends on precise heating schedules to maintain optimal properties, preventing microstructural flaws and poor cast quality.

110. (B) Accelerated corrosion of the nickel alloy

When two metals with different electrode potentials—like gold (noble) and nickel-based (less noble)—are in contact with saliva acting as an electrolyte, the less noble metal (nickel alloy) is prone to galvanic corrosion. Acidic conditions exacerbate this phenomenon, encouraging metallic ions to dissolve from the more active material. Nickel's passivation can break down under intense galvanic currents, leading to pitting and increased release of ions. The gold alloy remains relatively unaffected. Therefore, the nickel restoration corrodes more quickly, posing aesthetic, structural, and potential biocompatibility issues from metallic byproducts in the oral environment.

111. (C) Increases hardness and strength

Copper in gold alloys imparts solid-solution strengthening, making the alloy harder and stronger to withstand chewing forces. This property is especially valued in Type III and IV gold alloys used for higher-stress applications like crowns, bridges, and partial denture frameworks. Tarnish can increase somewhat with higher copper (A is opposite), and the melting point is lowered rather than raised (B is incorrect). White gold color typically arises from palladium or nickel additions, not copper (D). By boosting hardness, copper helps the alloy better resist wear, distortion, and occlusal forces during function.

112. (B) High-gold noble alloy

Nickel allergy can manifest as dermatitis, inflammation, or mucosal reactions if nickel-

containing alloys contact oral tissues. High-gold noble alloys typically lack nickel, thus reducing allergic responses and ensuring better biocompatibility. Nickel-chromium (A), titanium-nickel (C), and cobalt-nickel (D) each pose allergenic risk if nickel is present in any appreciable amount. Patients with proven nickel sensitivities do best with strictly nickel-free prostheses. Gold alloys that incorporate palladium or platinum are typically well-tolerated, do not corrode significantly, and maintain longevity. Therefore, a high-gold noble alloy is the safest choice to avoid exacerbating dermatitis.

113. (C) Galvanic corrosion

A gold onlay and an opposing base metal crown have different electrode potentials. In the presence of saliva, they form a galvanic cell, causing electrical currents to flow. The less noble metal corrodes, releasing metallic ions and producing an unpleasant taste or sensation. Passivation (A) would help protect the base metal if it were not physically contacting a more noble restoration under acidic conditions. Coefficient of expansion mismatch (B) relates to thermal changes rather than an electrochemical taste. Tarnish (D) is surface discoloration and does not typically generate an immediate metallic taste. Galvanic corrosion best fits these clinical findings.

114. (B) Nickel releasing oxides

Nickel-containing base metal alloys can form dark, sometimes greenish or blackish, oxide layers during porcelain firing. These oxides can leach to the porcelain-metal interface, affecting the crown's aesthetics. High palladium (A) in noble or high noble alloys does not typically create such dark oxide contamination. Ruthenium (C) is a trace element for grain refinement, not for oxide formation that discolors porcelain. Cobalt (D) contributes to passivation but is more common in cast frameworks for RPDs, not standard porcelain-fused-to-metal alloys. Nickel oxide formation remains the prime suspect behind dark interface staining beneath the ceramic.

115. (D) Use a high noble gold alloy verified nickel-free

Patients with verified nickel allergies can develop adverse local or systemic effects if nickel is present in a prosthesis. Opting for a high noble gold alloy specifically tested and guaranteed nickel-free ensures biocompatibility while retaining excellent mechanical properties and corrosion resistance. Reusing or placing any base metal restoration (A, B) risks allergic flare-ups unless certain it is nickel-free, which is often uncertain. Palladium-silver (C) sometimes includes trace nickel or other base metals, risking cross-contamination. Thus, the safest approach is a proven nickel-free high noble alloy that confers longevity and minimal allergic potential.

116. (C) Investing under vacuum or inert gas

Titanium reacts aggressively with oxygen and other gases at high temperatures, risking inclusion of oxide layers that weaken the final casting. Hence, protocols dictate using specialized, often phosphate-bonded investments under inert gas (like argon) or vacuum environments to minimize contamination. Gypsum-bonded investments (A) decompose at the temperatures required to melt titanium, generating sulfur dioxide and leading to porosity. Casting in ambient atmosphere (B) fosters excessive oxidation. While controlling temperature is vital (D), it's the inert or vacuum environment that most ensures a high-purity titanium cast, needed for structurally sound, biocompatible implant components.

117. (B) Localized bright red inflamed tissue precisely matching metal contact

In metal hypersensitivity, inflammation typically follows the exact contour of the metal framework, indicating a direct immunologic response where the alloy contacts mucosa. Diffuse plaque (A), generalized redness (C), or odor/calcification issues (D) suggest hygiene or fitting problems. Hypersensitivity presents as a sharply demarcated, inflamed or ulcerated area, correlating to the metal's shape or location. Such a distinct pattern signals an allergic or toxic reaction, rather than typical mucosal irritation from poor denture maintenance. In these cases, investigating for nickel or cobalt allergies and substituting an alternative material or coating may be necessary to resolve symptoms.

118. (B) Tingling or electric sensation upon biting

Galvanic shock occurs when two dissimilar metals in the mouth create an electric current in the

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presence of saliva. Patients often describe this as a sudden jolt, tingling, or "shock-like" sensation when the opposing metals contact, especially under biting forces. A chronic dull ache (A) or delayed throbbing (C) is more associated with pulpal or inflammatory issues. Referred pain to the ear (D) can happen with TMD or deep pulpitis. The hallmark of galvanism is a transient, abrupt electric-like discomfort correlating with metal-to-metal contact, typically alleviated by removing one of the metals or insulating them.

119. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Stainless steel orthodontic wires are manufactured by mechanical deformation (wrought process). This increases their yield strength and resilience while preserving ductility for clinical adjustments. These wires can be bent, shaped, and activated multiple times without fracturing, thanks to their capacity for work-hardening. They are also resistant to corrosion when exposed to oral fluids, due to chromium-induced passivation. Hence, the assertion is correct: stainless steel is a standard for ortho wires. The reason given—namely the ductility and adaptability (work hardening)—is precisely why they perform well, verifying that reason explains the assertion.

120. (A) Use a diamond bur at high speed with water spray

Chairside modifications of cast gold onlays typically involve carefully trimming marginal discrepancies and polishing. A diamond bur with copious water spray reduces heat buildup and scarring of the gold surface. Burnishing with a mallet (B) can risk fracturing cement lines or distorting the fit. Removing and re-casting (C) is overly aggressive unless the restoration is drastically flawed. Gold is more amenable to intraoral modification than many other materials, making "no adjustment" (D) unnecessary. Proper finishing includes refining margins, polishing to restore smoothness, and verifying occlusion. This procedure helps ensure correct fit and longevity of the final restoration.

121. (B) Glass-ceramic

Glass-ceramics, such as leucite-reinforced or lithium disilicate materials, incorporate crystals that distribute stress within a glassy matrix. This increases fracture resistance compared to traditional feldspathic porcelain, which lacks significant crystalline reinforcement. Zirconia (A) is a polycrystalline ceramic with minimal glass content, offering very high strength but reduced translucency. Porcelain-fused-to-metal's opaque layer (C) is designed to mask underlying metal, not fundamentally alter mechanical properties in the same manner. Feldspathic porcelain (D) has a predominantly glassy phase and is more prone to chipping under heavy load. Hence, glass-ceramics strike a balance between aesthetics and strength.

122. (A) Zirconia

Zirconia, specifically yttria-stabilized tetragonal zirconia polycrystal (Y-TZP), exhibits very high flexural strength, making it an ideal core material for full-ceramic crowns or bridges. Because it is quite opaque, many dentists apply an esthetic ceramic layer over it for the final restoration. Alumina (D) was once a common high-strength substructure but has been largely superseded by zirconia. Leucite (B) and lithium disilicate (C) are glass-ceramics, featuring improved translucency but lower flexural strength compared to zirconia. Thus, zirconia is aptly termed a "core ceramic" for providing structural support in all-ceramic restorations.

123. (C) It involves a phase change that arrests crack propagation

Zirconia's tetragonal grains can locally transform into a larger monoclinic phase when stressed at a crack tip, effectively compressing and inhibiting further crack growth. This transformation toughening significantly improves fracture resistance, making zirconia uniquely capable of withstanding the high forces in the posterior region. Although zirconia can still be layered with porcelain for improved esthetics, transformation toughening does not inherently enhance translucency (A). It decreases brittleness (B) rather than increases it. Zirconia is quite insoluble (D). Thus, the phase change mechanism forms the basis of zirconia's exceptional toughness among dental ceramics.

124. (C) Superior fracture toughness compared to zirconia

Lithium disilicate ceramics indeed offer attractive translucency, making them ideal for anterior

restorations, and they bond well to resin cements after etching with hydrofluoric acid and silane application. They can be fabricated through heat-pressing or CAD/CAM milling, providing versatility (D). While lithium disilicate is stronger than traditional feldspathic porcelain, it does not exceed zirconia in fracture toughness (C). Zirconia's transformation toughening mechanism makes it significantly more fracture-resistant, especially in posterior high-load areas. Thus, lithium disilicate delivers a balance between strength and esthetics but cannot surpass zirconia's toughness.

125. (B) Leucite-reinforced porcelain offers greater strength than purely feldspathic porcelain

Leucite crystals embedded in the glassy matrix of leucite-reinforced porcelain provide improved strength and resistance to crack propagation compared to standard feldspathic porcelain. This characteristic is valuable for restorations like veneers that endure functional and parafunctional forces. Feldspathic porcelain alone (A, D) is primarily a glass with minimal crystalline phase, making it more prone to fracture. Both materials can be used in anterior regions, but leucite-reinforced porcelain is better suited to moderate stress. For posterior crowns (C), neither is typically as robust as lithium disilicate or zirconia. Thus, leucite reinforcement adds structural benefits over pure feldspathic porcelain.

126. (C) Lithium disilicate

Lithium disilicate ceramics (often called IPS e.max) combine excellent translucency, suitable strength for anterior restorations, and the ability to bond effectively to tooth structure. Feldspathic porcelain (B) offers superior esthetics but has lower strength, making it more prone to chipping or fracture. Zirconia monolithic (A) boasts formidable strength yet typically lacks the same translucency unless special "high-translucency" zirconia is used, and even then, it may not match lithium disilicate's appearance. Metal-ceramic (D) can look good but cannot achieve the lifelike translucency possible with glass-based ceramics. Thus, lithium disilicate is generally the prime choice for purely esthetic anterior crowns.

127. (B) Etching with hydrofluoric acid and applying silane

Lithium disilicate features a glassy phase that can be selectively etched with hydrofluoric acid to create microscopic porosities. Subsequently, applying a silane coupling agent chemically links the ceramic surface to resin cement, enabling strong retention. Air abrasion with coarse alumina (A) can damage or weaken the crown's surface if done improperly or aggressively. Heating to high temperatures (C) is unnecessary and could compromise the ceramic's integrity or bonding resin. Skipping adhesive (D) on tooth structure would undermine retention and possibly cause microleakage. Proper HF-etching and silanation remain the cornerstone of effective lithium disilicate bonding.

128. (B) Controlling coefficient of thermal expansion mismatch

When veneering porcelain is applied over a zirconia substructure, both materials must expand and contract similarly upon heating and cooling. If the veneering ceramic's coefficient of thermal expansion (CTE) diverges significantly from zirconia's, residual thermal stresses accumulate at the interface, leading to chipping or delamination. Appropriate firing schedules also help, but the root cause often lies in mismatched CTE. Rapid firing (A) or inadequate core thickness (C) can exacerbate stress. Whether or not support pins (D) are used during layering is less critical. Maintaining a close CTE match is the primary step to reduce chipping risk.

129. (C) Abrupt quenching of the fired restoration in water

Porcelain is brittle and highly susceptible to thermal shock. Quenching a hot porcelain-fused-to-metal restoration causes rapid cooling, generating internal stresses that lead to microcracks or structural flaws. Conversely, selecting an alloy with a compatible CTE (A) ensures minimal stress. Slow cooling (B) prevents abrupt temperature gradients. A controlled oxide layer (D) fosters chemical bonding between metal and porcelain. Sudden immersion in water disrupts the porcelain's crystalline structure, drastically raising the risk of cracks. Hence, the recommended practice is to allow the restoration to cool gradually, thereby avoiding the stress fractures that compromise final strength.

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130. (C) Excessive shrinkage and possible color shift

Over-firing porcelain can exceed the sintering point for too long, leading to extra glass flow, distortion of shape, and changes in translucency or shade. The porcelain might become overly smooth or "flattened," losing morphological details. Excess shrinkage can create misfit on the restoration margins, while color shifts occur if pigments degrade or the surface gets too vitrified. Mechanical properties (A) do not necessarily improve; at times, over-firing can produce microcracks. Surface gloss (B) usually increases with over-glazing, so decreased gloss is not typical. Leucite content (D) remains composition-dependent and unaffected by slight over-firing.

131. (B) Their purely glassy matrix easily propagates cracks

Feldspathic porcelain relies on a mostly glassy phase, with minimal crystalline reinforcement. Glass is inherently brittle because any crack can freely propagate through an uninterrupted, amorphous matrix. In contrast, ceramics with well-dispersed crystalline phases—like leucite or lithium disilicate—can hinder crack growth. Larger crystalline fillers (A, D) are absent in conventional feldspathic porcelain. Feldspathic porcelain is used primarily in low-load or esthetic areas, especially anterior teeth (C), due to brittleness. Hence, the easily crack-propagating glass matrix explains its lower fracture toughness compared to modern, crystal-reinforced or polycrystalline ceramics.

132. (B) Slip casting

Slip casting is a technique where a porous "slip" of ceramic powder is formed into the desired shape, partially sintered, and then infiltrated with a molten glass. This method results in a strong, more homogeneous ceramic core. CAD/CAM milling (A) involves computer-designed restorations from blocks of ceramic or zirconia. Pressing (C) is commonly associated with heat-pressing leucite or lithium disilicate ingots into molds. The lost wax technique (D) is a casting process for metals or pressed ceramics but does not specifically entail porous infiltration of molten glass. Slip casting is primarily used to create high-strength ceramic substructures.

133. (C) Zirconia's high hardness demands diamond or zirconia-specific grinders

Monolithic zirconia is among the hardest dental materials, surpassing many standard ceramics. Conventional carbides or less robust burs struggle to cut effectively, generating friction, potential microcracks, or excessive heat. Diamond or zirconia-specific burs are engineered to handle zirconia's density and hardness, enabling controlled, efficient occlusal adjustments. Overheating risk is mitigated with water spray and specialized instrumentation. Rubber cups (D) can be used for final polishing, but they cannot effectively remove large amounts of material. Thus, specialized burs with adequate abrasive properties are essential to properly adjust monolithic zirconia restorations.

134. (C) Proper use of resin cement with total-etch technique

Debonding often results from lapses in adhesive protocol: poor enamel etch (A), no silane coupling agent on the veneer's inner surface (B), or contamination (D). These steps compromise the hybrid layer or the bond at the ceramic-resin interface. Conversely, "proper use of resin cement with total-etch technique" is a recommended protocol (C), strengthening the veneer's retention. It includes thoroughly etching enamel, applying a bonding agent, and ensuring the veneer's internal surface is etched or silanated, then seating with a suitable resin cement. Thus, doing it correctly prevents debonding, rather than causing it.

135. (A) Pressable ceramic generally has fewer potential internal flaws

Pressed ceramics involve heating an ingot to plasticity and then pressing it into a mold, potentially resulting in a dense restoration with fewer micro-voids if done properly. Milling a prefabricated ceramic block can introduce surface flaws or micro-chipping from the bur, depending on the milling system's accuracy and the block's microstructure. However, milled blocks are also high in crystallinity and can be fully contoured (D). The firing temperatures for pressing and sintering are similar, not drastically lower (C). Although both pressed and milled lithium disilicate deliver

excellent results, pressing may yield slightly fewer internal defects.

136. (C) Lithium disilicate (pressed or milled)

Lithium disilicate offers a practical balance of strength (roughly 350–400 MPa flexural strength) and reliable bonding. In a high-stress posterior area, pure feldspathic porcelain (A) is prone to fracture. Monolithic zirconia (B) is extremely strong but more challenging to bond reliably to tooth structure, although newer primers improve the interface somewhat. Alumina cores (D) can be strong but are typically used under layered porcelain and are less known for robust bonding. Lithium disilicate can be etched and silanated, forming a strong resin-cement interface that resists occlusal forces while preserving good esthetics in conservative onlay preparations.

137. (B) Monolithic zirconia crown with occlusal thickness at least 1.0 mm

Monolithic zirconia stands up well to bruxism thanks to its high fracture toughness. A thickness of around 1.0 mm on the occlusal surface helps ensure enough material to withstand heavy forces. Thin feldspathic (A) or leucite-reinforced crowns (D) risk chipping under strong occlusal loads, especially in bruxers. Glass ionomer (C) is a cement, not a structural ceramic. By using monolithic zirconia of sufficient thickness, the clinician gains durability and reduced risk of fracture or occlusal wear, while still maintaining an acceptable tooth-colored appearance—though not as translucent as glass-based ceramics.

138. (B) Intermittent water spray cooling

Ceramics are brittle. Excess heat or rough grinding can initiate microcracks, weakening the restoration. Intermittent water spray reduces frictional heat and flushes away particles, minimizing surface damage. This technique is especially critical for materials like zirconia or porcelain. Dry grinding (A) and no water with coarse diamonds (C) can cause localized overheating, leading to microfractures. Hammer taps (D) are not a recognized method for fine occlusal adjustment. By carefully grinding under water, the operator preserves the ceramic's integrity and avoids thermal stress that might compromise restoration longevity. Proper finishing and polishing afterward further reduce crack propagation sites.

139. (C) Over-thick application of opaque layers

Ceramic veneers derive their natural, translucent look from the layering of porcelain with minimal or strategic opacity. Overusing opaque porcelain sub-layers blocks light transmission and impairs esthetics, making the veneer appear chalky or dull. Correct firing temperatures (A) and vacuum (B) help remove air bubbles and ensure consistent sintering for better optical properties. Managing the cooling rate (D) is essential to avoid cracks but does not usually affect translucency unless extreme mismatch or microcracking occurs. However, applying too much opaque significantly reduces the veneer's ability to mimic the natural tooth's light dynamics.

140. (C) Replacing with pressed lithium disilicate veneer

When a feldspathic veneer fractures extensively, relying on the same brittle material may invite repeat failure. Lithium disilicate, with its crystal-reinforced glass matrix, delivers superior fracture resistance and excellent esthetics, especially for anterior teeth. Bonding a direct composite (A) can address small chips but not typically replicate veneer-like translucency or longevity. A zirconia crown (B) might be overly aggressive if adequate tooth structure remains and often requires more tooth reduction. An amalgam buildup (D) is neither esthetic nor commonly used for anterior coverage. Replacing with a pressed lithium disilicate veneer best balances strength, minimally invasive prep, and appearance.

141. (B) Lithium disilicate crown

Lithium disilicate (often e.max) can handle moderate posterior function while offering superior esthetics compared to many monolithic zirconia solutions. Zirconia without porcelain layering (A) has robust strength but often lacks the translucency patients want in premolars. Feldspathic over metal (C) contradicts the patient's request for a metal-free restoration. A polycarbonate crown form (D) is temporary, not a definitive solution. Lithium disilicate is well-known for its bondability, decent fracture toughness, and natural esthetic properties, making it suitable for premolars where both function

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and appearance matter. Consequently, it stands out as a strong yet attractive metal-free option.

142. (C) Assertion is true, but Reason is false.

CAD/CAM milled zirconia restorations have gained wide acceptance for posterior crowns because of zirconia's formidable strength, fracture toughness, and reduced need for substructures. However, zirconia's translucency can be lower than glass ceramics, though newer "high-translucency" variants have improved. It is also extremely insoluble in saliva, not more soluble. So, while the assertion is correct—zirconia is indeed popular for posterior restorations due to durability and milling precision—the reason provided is false: zirconia's popularity does not stem from high translucency or solubility. In fact, zirconia is well known for minimal solubility and only moderate translucency (in older formulations).

143. (B) Intraoral composite or porcelain repair kit

Conservative repair of minor porcelain fractures on metal-ceramic crowns is possible using specialized repair kits that include etchants, silane coupling agents, and composite resins. These kits create a bond between the remaining porcelain, exposed metal surface, and the repair resin. Complete replacement (A) is more costly and invasive if the fracture is small. Doing nothing (C) leaves an unsealed margin prone to plaque retention and further chipping. Orthodontic bands (D) have no role in porcelain repair. Repair kits, though not always indefinite, can extend crown life and postpone or avoid total replacement.

144. (A) Three-point bending test

The three-point bending test is the standard for assessing ceramic flexural strength (also known as modulus of rupture). A ceramic specimen is placed on two supports, and load is applied in the center until fracture occurs, measuring stress at break. Tensile bond strength (B) gauges the adhesive interface rather than bulk ceramic strength. Vickers hardness (C) is used for evaluating hardness (resistance to indentation), not flexural capacity. Thermocycling fatigue (D) examines material endurance under repeated temperature shifts. The three-point bending test specifically quantifies how well a ceramic resists bending forces before failure.

145. (B) Low impact strength

Acrylic denture base fractures often result from inadequate ability to absorb sudden stresses—also described as low impact strength. Repeated bending or accidental drops can form cracks at high-stress points (like around canines). High thermal conductivity (A) does not cause fracturing. Excess resin cross-linking (C) can actually improve strength up to a point. While excessive polymerization shrinkage (D) may create adaptation challenges or internal stresses, the recurrent fractures specifically hint at the denture's brittle nature. Increasing the resin's impact strength or reinforcing the base can help prevent such breakage in the future.

146. (C) Continuous immersion in hot water

Excessive heat exposure can degrade acrylic denture bases, accelerating color change and inducing micro-crazes. Continuous immersion in very hot water (above recommended temperatures) breaks down polymer chains over time, leading to aesthetic deterioration and structural microcracks. Proper monomer-polymer ratio (A) and heat processing (B) actually enhance the denture's quality if done correctly. Fiber reinforcement (D) typically strengthens the acrylic, not weakens it. Long-term immersion in excessively hot liquids (or cleaning solutions above recommended temperatures) negatively impacts PMMA's integrity, explaining the observed discoloration and crazing lines in the patient's old dentures.

147. (C) Reinforce the acrylic with a metal framework

When facing recurrent midline fractures from strong masticatory forces and inadequate ridge support, reinforcing the denture with a cast metal framework significantly boosts structural integrity. A flexible nylon denture (A) can reduce fracture risk but may not provide sufficient stability for heavy forces. Simply repairing with autopolymerizing resin (B) addresses immediate cracks but does not solve the underlying stress problem. Thicker flanges (D) help marginally, but may compromise comfort or hamper function if overextended. A metal framework integrated into the acrylic base efficiently redistributes forces, improving durability and lessening the likelihood of repeated fractures.

148. (C) Injection-molded PMMA with glass fiber reinforcement

For high-bite-force patients requiring aesthetics and minimal metal display, injection-molded PMMA reinforced with glass fibers can improve durability and stiffness while maintaining a tissue-colored appearance. Traditional unreinforced PMMA (A) might crack under heavy forces. Polyamide flexible dentures (B) look metal-free but often lack the rigidity for robust occlusion and can distort over time. All-ceramic partial frameworks (D) are uncommon, expensive, and overly rigid, risking fracture or tooth damage. Glass fiber reinforcement within an injection-molded PMMA base balances strength, aesthetics, and patient comfort, making it a sound choice for patients wanting minimal visible metal.

149. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Cross-linked acrylic denture teeth incorporate additional covalent bonds in the polymer matrix, improving wear resistance against opposing dentition and limiting surface abrasion. This cross-linking also lessens the polymer's solubility in oral fluids, conferring better color stability and mechanical strength. Thus, these enhancements directly account for improved wear resistance. Consequently, both statements are accurate, and the reason explains the assertion: the cross-linking process modifies the polymer structure, making it denser and more resistant to mechanical and chemical breakdown. This ensures prolonged esthetics and functional performance of the denture teeth compared to non-cross-linked acrylic types.

150. (B) Ensure a consistent polymer-to-monomer ratio

One primary cause of micro-porosity in denture base acrylic is improper mixing—particularly an incorrect polymer-to-monomer ratio. If the ratio is too high or too low, unreacted monomer or insufficient polymer leads to void formation upon polymerization. Another risk is incomplete pressurization or rapid temperature changes. Abruptly raising temperature (A) or skipping final curing (C) can trap air or cause residual monomer. Unbalanced compression molding (D) might introduce internal voids. Adhering to the manufacturer's specified mix ratio and recommended processing cycles helps maintain uniform polymerization, minimizing voids that compromise denture strength and longevity.

151. (C) Fabricating the wax pattern for cast restorations

Inlay wax is specifically formulated to create accurate patterns for gold or other cast restorations. These wax patterns are then invested and replaced by the final metal or ceramic during the casting process. Inlay wax is designed with good flow at slightly elevated temperatures, minimal residue upon burnout, and minimal distortion to produce a precise replica of the desired restoration shape. It does not serve as a long-term temporary restoration (A) nor is it typically used for bite registrations (B). Sealing crown margins (D) also isn't its role. Hence, its core function is pattern fabrication for casting procedures.

152. (D) Orthodontic relief wax

Orthodontic relief wax—often provided to patients in small sticks—offers a protective barrier over brackets, wires, or other orthodontic components. By smoothing sharp edges, it reduces irritation to the lips, cheeks, or tongue. Boxing wax (A) shapes around impression peripheries when pouring models, whereas utility wax (B) adjusts the periphery of impression trays or extends them. Baseplate wax (C) is used primarily for trial denture bases and tooth arrangement. Orthodontic relief wax's soft, moldable consistency makes it easy for patients to apply and remove, minimizing discomfort throughout treatment.

153. (C) Waxes change dimension significantly with temperature changes

Dental waxes often have one of the highest CTE values among dental materials, meaning they expand or contract markedly with small thermal fluctuations. This can compromise the accuracy of a wax pattern if it's manipulated in a hot environment and then returns to room temperature. Distortion in the pattern affects the fit of the final cast restoration. Waxes are not dissolved in saliva (A), nor are they intended for permanent intraoral rigidity (B). Some elasticity can be beneficial (D), but the defining challenge is their large dimensional change due to temperature variation.

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154. (C) Forming an immediate final impression directly in the mouth

Baseplate wax is primarily employed in removable prosthodontics to craft occlusal rims for jaw relation records (A) and as a base (bite block) for setting up prosthetic teeth (B, D). It is typically not used as an impression material (C). Baseplate wax lacks the flow, detail reproduction, and stability required to capture a precise impression of the oral tissues. Instead, various impression materials—like alginate or elastomers—are used for that purpose. Baseplate wax can soften at body temperature, so it's best reserved for constructing trial plates and occlusal setups rather than direct impressions.

155. (C) Pattern waxes require precise flow and minimal residue

Pattern waxes (inlay, casting, baseplate) must melt cleanly and leave minimal residue since they form the blueprint for the final restoration. They also need controlled flow characteristics—meltable enough for adaptation, yet stable once cooled, preserving accuracy. By contrast, processing waxes like boxing or utility wax are used in supportive tasks such as shaping and contouring the periphery of impressions or confining plaster. These waxes may not need the stringent low-residue requirements or precise thermal properties essential for creating cast restorations. Hence, pattern wax demands greater compositional refinement to avoid compromising final restorations.

156. (C) Maintains dimensional stability once cooled

Inlay wax must remain dimensionally stable between the wax-up temperature and room temperature, preventing distortion that would otherwise produce a poor restoration fit. Maintaining a consistent shape is crucial for accurate casting. High strength at oral temperature (A) isn't critical since the pattern is typically shaped outside the mouth. Ash residue (B) is undesirable—it can interfere with casting. Heavy contraction upon solidification (D) would lead to an undersized pattern and a misfitting restoration. Thus, limiting thermal distortion and shape changes in the finished pattern ensures a precise cast result for gold inlay restorations.

157. (B) Boxing wax

Boxing wax is applied around the periphery of an impression to create a "box-like" enclosure, preventing stone from running off and helping produce a neat cast base. By confining the gypsum mix to a limited space, the technician can pour the impression under controlled conditions, reducing bubble entrapment. Inlay wax (A) is for patterns, sticky wax (C) for temporarily joining components, and utility wax (D) for modifying tray peripheries or extending them. Therefore, boxing wax is specifically designed for shaping and containing the gypsum as it sets, ensuring a cleaner, more accurate cast.

158. (B) Heat the wax to ensure it flows and bonds

Sticky wax becomes cohesive and adhesive only when heated above its softening range. Once molten, it can flow into small gaps and seal or join fractured segments. Upon cooling, it solidifies and provides a stiff temporary bond, allowing the technician or dentist to transfer the assembly for more permanent repair. Simply applying it cold (A) will not create effective adhesion. Immersion in water (C) or light curing (D) are not relevant for sticky wax; it relies on temperature changes to modify viscosity and stickiness. Consequently, heating the wax sufficiently is the critical step for proper temporary adhesion.

159. (B) Excessively thinning the baseplate wax

Over-thinning baseplate wax can weaken the rim, causing it to flex or lack the structural stability for accurate occlusal record-taking. Proper wax thickness provides enough rigidity and retention to the record base. Softening the wax uniformly (A) ensures good adaptation without localized meltdown. Adapting at body temperature (C) helps conform the wax to the base shape. Trimming and contouring (D) are necessary for correct arch form and occlusal relationships. Hence, the principal mistake is making the wax too thin, risking distortion or detachment while the dentist captures maxillomandibular relationship records.

160. (B) Likely distortion due to thermal expansion or contraction

Inlay wax is notoriously temperature-sensitive, expanding or contracting even with modest shifts

in ambient temperature. If patterns are moved from a warm environment to a cooler one (or vice versa), they can warp slightly, throwing off critical dimensions. That distortion directly impacts the fit of the final restoration, resulting in open margins or high occlusion. Proper storage at a stable temperature—and prompt investment after pattern fabrication—is crucial to safeguard accuracy. Inconsistent temperatures do not improve accuracy (A), nor do they facilitate faster burnout (C). Bonding to investment (D) is not an issue for wax patterns.

161. (C) Improving flexibility and workability

Plasticizers introduce lower molecular weight components that lessen intermolecular forces, making the wax more pliable. This enables easier adaptation to cast or denture bases, and helps form stable occlusal rims without fracturing during manipulation. They do not increase brittleness (A); instead, they reduce it. Flow at mouth temperature (B) typically increases with plasticizers, meaning the wax remains workable. However, minor changes in melting point occur, but it's not always a drastic drop (D). The key advantage is improved handling characteristics, letting clinicians or technicians shape and sculpt wax with less cracking or flaking.

162. (B) Extending tray length

Utility wax, often supplied in rope form, serves to adapt or extend an impression tray's periphery, especially for patients with certain anatomical variations or a gag reflex triggered by tray overextension. By adding utility wax, the dentist can better conform the tray to the patient's anatomy without metal edges irritating tissues or triggering a gag response. It's not used for registering occlusal relationships (A) or forming final patterns (C). Sealing a cast model (D) typically uses different wax or plaster-based methods. Hence, the wax is primarily added to improve tray extension and comfort.

163. (A) Quick adhesion upon cooling

Sticky wax adheres strongly once it cools, letting the dentist secure small relief shims or attach acrylic components in position before final adjustment. Its rapid set is helpful for quick clinical modifications or repairs. While it has a moderate melting point, it doesn't remain tacky at room temperature (C). Residue-free removal (D) is generally desired, but sticky wax can sometimes leave traces if overheated. Slow hardening with minimal stiffness (B) contradicts the typical property of sticky wax, which is quite firm once cooled. The immediate bond it provides is what makes it effective for short-term clasp or partial denture adjustments.

164. (C) Soft pliable manipulation at room temperature

Utility wax, also known as periphery or rope wax, has a low melting range that's near room temperature, making it easy to adapt by hand without requiring significant heat. Dentists can shape it to fine detail along the tray edges. It's not used for rigidity (A) nor does it need high temperatures to bond (B); its principal asset is convenience and slight tackiness at normal temperatures. Its coefficient of thermal expansion (D) is relatively higher than many other dental materials. Hence, its user-friendly pliability makes it ideal for minor tray border extensions or modifications.

165. (D) Increased flow near mouth temperature

Baseplate wax is engineered to be workable at oral or near-oral temperatures, so it can be adapted for bite registration and tooth arrangement. However, this workable nature also means that once it's exposed to the patient's mouth or a warm environment, it can become slightly more fluid, potentially leading to distortion if not handled promptly. If the rims are left too long in a hot operatory, or if the wax is overheated, it may sag or lose shape. It's not primarily about poor bonding (A), high thermal conductivity (C), or low flow (B), but rather its increased flow with warmth.

166. (B) Capturing interocclusal relationships

Bite registration wax is designed to record how the upper and lower teeth come together, providing a quick method to articulate models or confirm occlusal relationships in prosthodontic and restorative procedures. This wax is typically placed between the arches, and the patient bites down gently, leaving imprints of both arches. It is not a permanent restorative material (A), nor does it serve in bracket bonding (C), and it is not used for sealing impression borders (D). Thus, its distinct

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role is precisely to capture the spatial relation of opposing teeth.

167. (B) Sticky wax

Sticky wax is a blend of beeswax and resins that becomes very hard and brittle at room temperature. When heated, it's tacky, allowing items to be joined. On cooling, it sets rigidly and can be easily fractured later without excessive residue. Utility wax (A) remains pliable, boxing wax (C) maintains flexibility for shaping, and white orthodontic wax (D) is used for patient relief over bracket edges. Thus, sticky wax stands out for its adhesiveness when melted and brittleness when cooled, making it invaluable for temporarily assembling components in a dental lab.

168. (B) It determines if the final metal casting will be porous

During the lost-wax casting technique, the wax pattern is heated and "burned out" from the investment mold, leaving a void for molten metal to fill. If the wax doesn't vaporize cleanly at the correct temperature, residue or incomplete elimination can occur. These remnants may form voids, leading to porosity, inclusions, or defects in the final casting. Wax burnout doesn't create chemical adhesion (A), nor does it measure solubility in monomers (C). It should not impede adaptation to margins (D). Ultimately, successful burnout ensures the mold is free of contaminants that might compromise metal integrity.

169. (B) Immediate rigid set upon placement

Utility wax (rope wax) is known for its flexibility at room temperature, making it simple to adapt around tray edges. It remains reasonably soft and does not become rigid immediately after placement, which is helpful for fine adjustments. It's generally biocompatible (C) and can be trimmed or shaped with minimal heat (D). The incorrect statement is that it sets "immediately rigid" (B). In fact, it stays somewhat pliable, allowing the operator to modify it if needed, which is precisely why it's valuable for achieving a comfortable, functional tray extension during border molding.

170. (C) Corrective waxes flow in thin layers to record tissue details

Corrective impression waxes are specifically formulated to flow at mouth temperature in a thin film, allowing them to capture fine surface details in edentulous or partially edentulous impressions. They can refine the impression of soft tissues or fill small voids. In contrast, inlay waxes are heated extraorally, shaped into patterns for cast restorations, and must not distort upon cooling. Inlay wax does play a major role in final cast accuracy if used incorrectly (D is incorrect). Corrective wax is not designed for minimal-residue burnout (A) nor for building entire cast restorations (B). Its chief function is detail refinement.

171. (D) Border molding wax (stick modeling wax)

Stick modeling wax, often referred to as border molding wax, is used to capture functional tissue movements around the periphery of a denture impression. It's heated and then molded dynamically as the patient performs movements (e.g., smiling, opening). This ensures a more accurate seal and extension of the denture flange. Inlay wax (A) is reserved for cast patterns. Baseplate wax (B) is for occlusal rims or trial dentures. Impression compound (C) is a thermoplastic material that can be used similarly but is more rigid and typically less refined than specialized border molding wax.

172. (B) Work in a cool environment or refrigerate the wax

If the operatory or the patient's mouth is especially warm, baseplate wax may soften and flow excessively, causing distortion during the try-in. By cooling the wax or working in a cooler setting, the wax's temperature remains below its flow threshold, preserving shape. Heating with a flame (A) would increase flow. Eugenol addition (C) is used for sedative cements, not typical in modifying wax properties. Choosing a lower melting range wax (D) would make it even more prone to soften. Hence, chilling or keeping the environment cooler is a practical step to reduce undesired wax flow.

173. (B) Moderate elasticity upon cooling

A matrix made from sheet wax should be flexible enough once it cools so it can be lifted off the prepared teeth without tearing or deforming the

uncured provisional material. This elasticity prevents the wax from fracturing or the provisional from being pulled apart. Very high melting point (A) is unnecessary and may be difficult to manipulate. A sticky surface (C) would risk adherence to the provisional. Achieving "zero" thermal expansion (D) is not realistic in waxes. A slight, controlled elasticity gives the wax the ability to release smoothly, preserving the form of the newly formed restoration.

174. (D) Removing the wax pattern from the ring just before investing

In the lost-wax technique, the wax pattern is not physically removed by hand from the investment ring; rather, it remains in place. Once the investment sets around the pattern, the entire ring is heated to burn out the wax, leaving a hollow mold. Manually removing the pattern beforehand would defeat the entire process. Correct environment control (A), correct burnout temperature/time (B), and timing placement (C) are all essential to ensure the wax fully vaporizes. If the pattern is pulled out prematurely (D), no complete mold forms, causing incomplete burnout or misformed spaces leading to casting flaws.

175. (B) Overextension leading to inaccurate vestibular recording

Utility wax can be built up along the periphery of an impression tray to accommodate anatomical variations or patients prone to gagging. However, if applied excessively or not carefully adapted, the tray border can extend beyond the functional vestibule or into tissues, creating a distorted or overextended impression. This overextension means the final model will not accurately reflect the patient's true oral boundaries. Strengthening the tray (C) or eliminating the gag reflex (D) is not guaranteed. Proper technique is crucial to ensure the wax augmentation captures the correct depth and shape of the sulcus.

176. (B) It remains stable for a longer period in the mouth

A higher softening range means the wax transitions from solid to plastic at a higher temperature, reducing the likelihood of warping at normal body or room temperatures. As a result, it resists distortion when used as an occlusal rim or baseplate inside a warm operatory or patient's mouth. A wax with a higher melting or softening range does not distort easily (A) nor flow excessively (C). It can still be used to build occlusal rims (D); in fact, that's exactly when a higher softening range can be an advantage for better dimensional stability.

177. (A) Low flow at mouth temperature

Inlay wax should have minimal flow at mouth or near-mouth temperatures to maintain shape during and after intraoral manipulation. If it flows excessively while in contact with body heat, the pattern can deform upon removal. High tensile strength (B) helps limit breakage but doesn't necessarily address distortion. A high coefficient of thermal expansion (C) is undesirable, but the question specifically cites mouth-temperature distortion, pointing to excessive flow. Complete burnout (D) relates to the casting step, not immediate deformation. Consequently, insufficiently low flow at functional temperatures likely caused the wax pattern to distort upon removal.

178. (D) Delayed investment, causing the pattern to distort

If a completed wax pattern is left un-invested for an extended period, temperature fluctuations or simple relaxation of internal stresses can induce slight warping, resulting in open margins post-casting. Low residual ash (A) is desirable (it doesn't cause margin discrepancy), and "excessive thermal stability" (B) is not a typical problem—rather, waxes distort with modest temperature changes. Carving at room temperature (C) is standard procedure. The critical factor is that wax patterns must be invested as soon as feasible after completion, preventing thermal or mechanical distortions. This ensures that the final metal restoration accurately reflects the original pattern.

179. (B) Apply boxing wax around the tray edges

Boxing wax is specifically made to create a neat border or "wall" around the impression, preventing gypsum from escaping and helping build a stable base for the cast. When used properly, it reduces the chance of entrapped air or incomplete pouring by retaining the stone in a controlled area. Inlay wax (A) and sticky wax (D) have different functions and are not meant for controlling the plaster flow.

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Switching to a different impression material (C) does not address the fundamental pouring issue. Boxing wax ensures that the stone is poured smoothly, yielding a more accurate cast.

180. (B) Quick rinsing in warm water to remove debris, then investing promptly

To preserve the accuracy of a wax pattern, guidelines suggest gently cleaning away saliva or surface debris with warm water, or using a mild disinfectant if contamination is suspected. The pattern should then be dried and promptly invested to avoid any dimensional changes due to temperature fluctuations or internal stress relaxation. Storing for days (A) risks distortion, while heating the pattern near its melting point (C) can warp it. Freezing overnight (D) can introduce condensation upon return to room temperature. Hence, a brief rinse and immediate investment maintain fidelity for a precise final casting.

181. (A) Black discoloration or soot inside the investment

If the wax fails to burn out cleanly, it can leave a carbonaceous residue that appears as black soot or discoloration within the mold. This residue prevents the metal from fully flowing into fine details, causing incomplete castings. Smooth internal surfaces (B) would typically suggest successful burnout, while (C) references a short burn cycle but doesn't necessarily explain the black residue. Residual monomer (D) pertains to acrylics or resins used in 3D-printed patterns, not in standard inlay or casting wax. Hence, black soot or persistent carbon is the red-flag sign that wax burnout wasn't fully achieved.

182. (B) Matrix distorts upon removal

When a wax matrix softens excessively in the patient's mouth, it loses structural integrity and can deform as it's pulled off the teeth. This distorts the shape intended for the provisional restoration. Patients typically do not complain of taste changes (A) with standard wax. Perfect adaptation (C) would be a sign of successful use, not an issue. Hard, rigid matrix (D) contradicts the described softening. Thus, if you notice repeated or consistent warping of the matrix upon removal, it signals that the wax's thermal properties are inadequate for the mouth's environment.

183. (C) Assertion is true, but Reason is false.

Boxing wax indeed helps confine the stone when pouring an impression, raising the effective height to form a uniform base. This ensures a consistent cast thickness. However, the reason given—"high flow at mouth temperature enabling interocclusal records"—is incorrect for boxing wax. It does not rely on mouth-temperature flow or primarily capture occlusal relationships; that is the domain of bite registration or baseplate wax. Boxing wax remains relatively stiff at room temperature, focusing on shaping or "boxing in" the impression. Hence, the assertion is correct, but the reason is erroneous.

184. (B) Leaving a slight spacer or relief near the contact

When carving the wax pattern, the technician or dentist typically builds the proximal contact slightly under the ideal final shape, anticipating that finishing and polishing metal will reduce the contact slightly more. If the wax pattern is carved to full contact with no room for finishing, the final restoration often binds. Using utility wax (A) is not a standard approach. Overheating the pattern (C) risks distortion, and investing at a high temperature (D) relates to burnout, not contact adjustment. Hence, a minor relief in the wax's proximal contact area ensures correct final contact after metal finishing.

185. (C) Thermogravimetric analysis (TGA)

Thermogravimetric analysis measures weight changes in a material as it's heated. By progressively raising the temperature, labs can see if the wax completely combusts or leaves a notable residue (ash). This is particularly relevant for inlay or casting waxes meant for lost-wax procedures. Bond strength (A) and three-point bend tests (D) are mechanical evaluations, while microstructure analysis (B) usually examines metal or ceramic post-casting. TGA specifically reveals at which temperatures the wax decomposes and how much mass remains, indicating potential contaminants or fillers that might create ash and compromise the final casting.

186. (C) Low glass transition temperature

Glass transition temperature (Tg) signifies the point at which a semi-solid transitions into a more pliable or rubbery state. If the wax has a low Tg,

it softens readily from body or even finger heat, leading to smearing and difficulty in refining occlusal contours. A high melting range (A) would reduce smearing. Low flow (B) is actually desirable to maintain shape. Brittleness at body temperature (D) would cause flaking or cracking, not smearing. Therefore, once the wax dips below its glass transition threshold, it becomes overly malleable, complicating precise occlusal adjustments.

187. (D) Improves adaptation to the deep vault

Placing rope (utility) wax along the tray's palate region helps fill any gap between the tray and a high-arched palate. This modification ensures the impression material is supported effectively, leading to better adaptation in deeper areas. It does not create definitive cast margins (A); that's the impression's role. A rigid base for bite registration (B) is usually a separate step. "Preventing tray overextension" (C) would involve trimming or adjusting tray flanges, not placing wax in the palatal vault. Thus, using wax in the palatal region ensures a more accurate impression by accommodating the patient's anatomy.

188. (C) Good carving ability and moderate flow

A diagnostic wax-up demands a wax that is easily sculpted, enabling the clinician to replicate the proposed contours accurately. Moderate flow at working temperature eases adaptation and shaping, yet it must remain stable enough not to slump once the shaping is done. Quick burnout (A) is irrelevant here because the wax-up is for demonstration, not for immediate casting. Translucency at mouth temperature (B) might be nice aesthetically, but it's not a critical functional property. Structural support at 100°C (D) is beyond normal clinical conditions for a trial smile. Hence, a wax with solid carving and shaping properties is crucial.

189. (A) Rigid set at mouth temperature

When a custom tray must accommodate undercuts or irregular contours, the added material (like modeling or border molding wax) should maintain stability in the patient's mouth. If it softens too much and collapses under normal oral temperatures, it signifies insufficient rigidity at mouth temperature. Brittleness (B) doesn't help—excess brittleness could crack. Sticky adherence (C) is more typical of sticky wax and is not needed for tray modifications. Color stability (D) is not a functional requirement. Hence, if the wax collapses under normal conditions, it lacks the firmness required to hold shape in situ.

190. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Wax patterns can develop internal stresses if manipulated excessively while partially cooled, or if heated and cooled unevenly. Once the pattern is lifted off the preparation or die, these locked-in stresses may release, causing subtle but critical dimensional changes and open margins. Hence, it's important that inlay wax patterns be formed with minimal stress by careful, uniform heating and cooling. The assertion (that wax patterns should be free from internal stresses) is indeed correct. The reason provided—that leftover stresses can lead to distortion on removal—is the direct explanation. Both the statement and its rationale align perfectly.

191. (B) Press boxing wax flush to the impression borders

For a well-defined cast with uniform thickness, the boxing wax must fit snugly against the impression periphery, preventing stone from escaping around the edges. This creates a neat "box" into which the stone can be poured. Heating the wax to a fluid state (A) is neither necessary nor desirable. Sticky wax (C) is used for joining pieces, not for shaping the cast base perimeter. Skipping the base layer of stone (D) defeats the purpose of a double-pour technique. Proper boxing with a clean seal around the impression ensures a neat, even base after pouring.

192. (C) Minimize handling and invest promptly

Handling wax patterns excessively can introduce or release internal stresses, leading to dimensional changes. Rapid chilling (A) can shock the wax and cause micro-distortions, while storing under a heat lamp (B) might soften it. Coating the entire pattern with sticky wax (D) is unnecessary and can cause surface irregularities or residue. The best approach is to carefully remove the pattern from the die with minimal manipulation, check its margins, and invest it in the casting ring as soon as possible. This practice limits opportunities for thermal fluctuations

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or physical deformation that could compromise the final restoration's fit.

193. (C) Excess heating of pattern wax on the refractory cast

When too much heat is applied to pattern wax directly on a refractory cast, the expansion and contraction cycles can cause minor warping of the cast or the wax itself. This warping translates into an inaccurate final design, preventing the RPD framework from seating properly in the patient's mouth. Completing the wax-up swiftly (A) or using minimal wax (B) does not necessarily lead to distortion unless technique is poor. Quick cooling in air (D) is typically acceptable, as gentle ambient cooling rarely causes severe distortion. Excessive localized heat is the major culprit behind refractory cast or wax pattern warpage.

194. (A) Visible gap at the cavosurface margin under magnification

Distortion of inlay or onlay wax patterns most frequently manifests as a detectable opening at the cavosurface margin—the critical juncture where the restoration meets the tooth surface. Under magnification, any warping can be seen as a slight separation or gap. A smoothly contoured axial wall (B) or a well-adapted internal surface (C) doesn't guarantee the margin remains sealed if thermal or mechanical stress has caused marginal lift. If no discrepancy is visible upon die inspection (D), it indicates no visible distortion. Hence, a clear gap is the prime indicator of a deformed margin.

195. (C) Assertion is true, but Reason is false.

Ideally, pattern waxes should exhibit minimal thermal expansion at the temperatures where they are manipulated and stored, preventing dimensional shifts that compromise restoration fit. Claiming that "excessive expansion ensures better fit" is incorrect, as expansions or contractions can lead to open margins, occlusal discrepancies, or poor adaptation. A stable pattern dimension is vital for an accurately cast restoration. Hence, the assertion is valid: minimal expansion is desired. The reason, however, is false: excessive expansion does not yield improved fit—rather, it undermines accuracy. So the correct pairing is a true assertion but a false reason.

196. (C) Maintain a controlled room temperature and invest immediately

Wax pattern distortion frequently arises from repeated or variable heating-cooling cycles. Controlling the environment—keeping the pattern in a stable temperature zone—prevents expansion-contraction stresses. Investing soon after completing the wax-up locks its shape in the refractory mold before it can warp. Flame-heating (A) can cause localized melting. Freezing (B) risks condensation and potential warpage upon thawing. Carving over multiple days (D) prolongs the risk for repeated temperature fluctuations. Therefore, limiting thermal exposure and promptly investing ensures minimal dimensional change, leading to better marginal accuracy in the final onlay casting.

197. (C) Contact angle measurement on wax surface

Measuring the contact angle on a wax surface can reveal if contaminants—like moisture, oils, or other residues—are present. A high contact angle might indicate a hydrophobic or oily film that prevents the investment material from wetting the pattern properly, causing nodules or blebs in the final casting. X-ray fluorescence (B) identifies elemental composition, which might not detect small contaminants. Colorimetric pH analysis (A) is not typical for wax. Particle size distribution (D) pertains more to powders, not wax surfaces. Therefore, evaluating how liquids spread over or bead up on the wax can detect contamination-induced defects.

198. (A) Adequate toughness

Wax flaking suggests it's brittle or unable to withstand routine manipulation, indicating low toughness. Dental baseplate or setup wax requires enough toughness so that occlusal rims or tooth setups can be adjusted without chipping. High thermal expansion (B) is unrelated to surface flaking, while translucency (C) doesn't affect mechanical integrity. Rapid burnout (D) is important in casting or pattern wax, not specifically in a denture wax-up. Hence, lacking adequate toughness explains why the wax cracks or flakes under normal stress during try-in, complicating occlusal adjustments and final arrangement.

199. (B) Rigid set after cooling

Sticky wax is heated to become tacky, then applied to the area needing repair. Once it cools, it stiffens and provides a stable union for the patch piece, preventing movement while the autopolymerizing resin cures. This rigid set is crucial for a precise repair, ensuring the newly bonded section aligns properly with minimal gap. A permanent bond at oral temperature (A) is incorrect, as sticky wax can be fractured intentionally. High fluidity at low temperature (C) is the opposite of sticky wax behavior, and a slow setting reaction (D) is not characteristic—it hardens rather quickly as it cools.

200. (C) Pronounced thermal expansion coefficient

Modeling wax can exhibit a relatively large coefficient of thermal expansion, meaning modest temperature changes—like those from overhead operatory lights or body heat—can cause dimensional changes. As the wax warms, it expands and softens; when it cools, it contracts. These repetitive expansions and contractions lead to noticeable warping at thin margins. A high glass transition temperature (A) would actually make it more stable at moderate temperatures, while minimal flow (B) is not the culprit if distortion is happening. A high modulus of elasticity (D) suggests stiffness, not the tendency to warp. Thermal expansion mismatch remains the key issue.

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CHAPTER 02

ORAL PATHOLOGY

1. (C) A congenital anomaly resulting from incomplete fusion of the palatal shelves

   Cleft palate is a developmental defect that arises when the palatal shelves do not unite along the midline, resulting in an opening or discontinuity in the palate. The defect may involve just the soft palate or extend to the hard palate and alveolar ridge, depending on severity. Incomplete fusion of the palatal shelves is the fundamental embryological issue. Although the alveolar process can be affected, it is this failure of the shelves to fuse that defines the cleft. A midline uvular defect may be a mild form, but the unifying cause is impaired shelf coalescence.

2. (C) 9th to 10th week in utero

   Palatal fusion is a critical phase of craniofacial development that usually occurs between the 9th and 10th weeks of gestation. During this interval, the palatal shelves, initially positioned on either side of the tongue, move upward and converge medially to fuse. Disruptions in this process can cause clefts of the palate. Earlier periods (e.g., 3rd–4th week) are associated with neural tube development, whereas the 12th–13th week exceeds the typical window for palatal fusion. Correct timing of the shelf union ensures a separation between nasal and oral cavities.

3. (B) Fusion of the medial nasal and maxillary processes

   Cleft lip typically results when the medial nasal process fails to unite with the maxillary process during the 4th to 7th weeks of embryonic life. The central segment of the upper lip (including the philtrum) arises from the medial nasal processes, while the maxillary processes form the lateral lip segments. Failure of these structures to fuse produces a cleft lip of varying severity. In contrast, the lateral palatine processes primarily contribute to the hard and soft palate, and the frontonasal–mandibular processes do not determine the midfacial segments of the upper lip.

4. (D) Bifid uvula

   Pierre Robin sequence is characterized by a small mandible (micrognathia), downward or posterior positioning of the tongue (glossoptosis), and a U-shaped cleft palate. The sequence originates with mandibular underdevelopment, which keeps the tongue high in the oral cavity, obstructing normal palatal shelf fusion. Although a bifid uvula is a sign of a minor form of cleft, it is not a hallmark of Pierre Robin sequence. The most recognized triad involves severe mandibular deficiency, tongue displacement, and the resultant U-shaped cleft in the palate.

5. (C) Macroglossia arises from excessive proliferation of tongue tissues; microglossia is linked to incomplete tongue bud development

   Macroglossia results from abnormal overgrowth of the lingual tissues, as seen in syndromes such as Beckwith-Wiedemann or in conditions like acromegaly. Conversely, microglossia reflects insufficient embryologic growth of the tongue bud, producing a smaller-than-normal tongue. These anomalies can impact speech, swallowing, or the dental arches. Though endocrine disorders may exacerbate macroglossia, various genetic or syndromic factors underlie both conditions. They represent different embryologic pathways—one of overgrowth versus one of underdevelopment—each potentially occurring independently or as part of broader syndromes affecting craniofacial structures.

6. (B) Immediate frenectomy

   Ankyloglossia involves an abnormally short or tight lingual frenum that restricts tongue movement. This can impair speech articulation, feeding, or both. When functional problems are evident, particularly regarding speech, a frenectomy (surgical release of the frenulum) can yield immediate improvements by granting the tongue the necessary range of motion. While speech therapy may complement the procedure, relying on therapy alone may be ineffective if a mechanical restriction persists.

Orthodontic evaluation is helpful if malocclusion accompanies the condition, but it does not address the root mobility issue. Delaying intervention risks protracted speech challenges.

7. (B) Thyroglossal cyst

A thyroglossal cyst arises from remnants of the thyroglossal duct when the thyroid gland migrates from the foramen cecum at the base of the tongue to its final cervical position. If ductal remnants fail to regress, cystic swellings can develop along this tract, often presenting midline near the hyoid bone or in the floor of the mouth. Dermoid cysts and branchial cleft cysts tend to occur off-midline. A cystic hygroma is commonly found in the lateral regions of the neck. Therefore, a painless midline mass strongly suggests a thyroglossal duct cyst.

8. (C) Immediate feeding support and use of specialized cleft feeding devices

Infants with extensive cleft lip and palate often struggle to create sufficient negative pressure for effective sucking, placing them at risk for poor nutritional intake and aspiration. The first and most pressing concern is establishing safe feeding. Specialized feeding bottles, assisted feeding techniques, or obturators can help these infants receive adequate nutrition. Surgical correction of the lip typically occurs around three months of age to optimize healing and growth. Speech therapy is usually required later, especially after palate repair. Genetic testing may be done in suspected syndromic cases but is not the immediate priority.

9. (B) Philtrum

In a unilateral cleft lip, the philtrum—derived from the medial nasal process—fails to fuse with the maxillary process. This disruption produces a visible cleft on one side of the upper lip. The premaxilla is part of the anterior maxillary segment and may be involved if the alveolar ridge is cleft, but the philtral region is the hallmark site of fusion failure. The tubercle of the upper lip is a midline prominence that can appear asymmetrical in cleft lip, while the labial frenum is a minor structure that does not define cleft lip fusion sites.

10. (C) Ankyloglossia always resolves spontaneously

While mild tongue-tie may improve slightly as a child grows, ankyloglossia often requires surgical intervention (frenectomy) if functional problems like feeding or speech deficits are significant. It does not invariably self-correct. Microglossia frequently coexists with mandibular underdevelopment, and macroglossia can indeed lead to malocclusion due to the enlarged tongue pressing against the dental arches. Glossitis, however, is an inflammatory condition stemming from causes like nutritional deficiencies or infections, not a congenital anomaly. Therefore, the statement claiming ankyloglossia always resolves spontaneously is incorrect.

11. (B) Cleft lip with or without cleft palate is more frequent than isolated cleft palate

Epidemiological data show that cleft lip, with or without palate involvement, has a higher incidence than isolated cleft palate. Though exact prevalence varies worldwide, the majority of orofacial clefts include a lip component. Isolated cleft palate comprises a smaller portion of these developmental abnormalities. Both types can be part of syndromes or occur independently. Some, such as Pierre Robin sequence, specifically involve palate issues, yet many cases present sporadically. Consequently, cleft lip (with or without palate) remains numerically more common than an isolated cleft palate.

12. (B) Cleft lip and/or cleft palate

Maternal smoking is a recognized risk factor that increases the incidence of orofacial clefts. Tobacco exposure influences blood flow and disrupts essential developmental pathways, leading to an increased likelihood of cleft lip and palate formation. Macroglossia is often associated with endocrine disorders or genetic syndromes, while ankyloglossia tends to be an isolated embryologic variation and not directly tied to maternal smoking. Fordyce's granules (ectopic sebaceous glands) are benign findings and unrelated to environmental factors. Hence, maternal smoking is most notably linked to cleft lip and/or palate.

13. (C) Complete cleft palate

A complete cleft palate extends through both the soft and hard palate, allowing milk to pass into the nasal cavity and causing feeding complications. It

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typically appears as a clear, continuous opening from the uvula area forward. Submucous cleft palate may be subtler, masked by an intact mucosal layer. While a bifid uvula can be a minor indicator of palate anomalies, it does not alone account for significant nasal regurgitation. Unilateral cleft lip primarily affects the lip region, not the palate, so it would not produce these specific feeding issues.

14. (A) Velopharyngeal insufficiency

Velopharyngeal insufficiency (VPI) occurs when the soft palate fails to achieve complete closure against the posterior pharyngeal wall, allowing air to escape nasally. Children with a history of cleft lip or palate repair may develop VPI due to scar formation or muscle dysfunction, leading to hypernasal speech and difficulty pronouncing certain consonants. Frequent ear infections (otitis media) often accompany cleft-related Eustachian tube dysfunction. While tongue thrusting or adenotonsillar issues can affect speech or nasal breathing, inadequate palatal elevation and chronic ear problems most strongly indicate VPI as the underlying cause.

15. (C) 9 to 18 months of age

Surgeons generally aim to repair cleft palates between 9 and 18 months, when the palate is large enough to operate on effectively but early enough to support normal speech development. Repairing too early (under 6 months) may be technically challenging due to smaller anatomical structures, while waiting until after 18 months increases the risk of maladaptive speech patterns. Cleft lip repairs often occur earlier (around 3 months). By closing the palate before critical speech milestones, the child can develop more typical articulation and significantly reduce the likelihood of persistent speech deficits.

16. (D) Nephrologist

A cleft care team typically includes a plastic surgeon for the primary lip and palate repairs, a speech-language pathologist for feeding and articulation issues, a pediatrician for overall health monitoring, an orthodontist to address occlusal needs, and potentially an otolaryngologist for ear-related concerns. A nephrologist, who specializes in kidney function, is not a standard member of this core group unless there is a specific concomitant renal anomaly. As a result, involvement of a nephrologist would be rare and not a routine element of cleft treatment protocols.

17. (C) Presence of congenital heart defects

While many clefts present as isolated anomalies, the presence of additional congenital defects—particularly cardiac abnormalities—suggests a syndromic presentation. Examples include 22q11.2 deletion syndrome or Van der Woude syndrome, where clefts coexist with other organ system defects. A family history may imply a genetic predisposition but not necessarily multi-system involvement. Normal growth parameters can occur in both isolated and syndromic clefts. Otitis media is common in cleft palate due to Eustachian tube dysfunction and does not automatically indicate a broader syndrome. Cardiac issues, however, raise strong suspicion of syndromic etiology.

18. (A) Nasal regurgitation during feeding

Submucous cleft palate involves muscular or bony defects concealed by an intact mucosal layer, often hinted at by a bifid uvula or a bluish area along the midline. Nasal regurgitation occurs because the soft palate cannot properly seal off the nasopharynx during swallowing. Macroglossia and midline mandibular clefts represent different developmental disturbances. A crossbite might develop from jaw or tooth misalignment but is not a specific indicator of submucous cleft. In contrast, nasal regurgitation is highly suggestive of velopharyngeal inadequacy due to the underlying palatal defect.

19. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

With modern high-resolution ultrasound, examiners can visualize fetal craniofacial structures during the 18–20-week scan, detecting orofacial clefts when sufficiently pronounced. Thus, it is true that cleft lip and palate can be identified in utero, and the reason—namely that mid-trimester ultrasound provides a detailed view of the fetus's face—is indeed why they are diagnosable at that stage. Early recognition aids counseling and multidisciplinary planning for delivery and postnatal surgical needs.

20. (A) Palatoplasty

Submucous cleft palate involves deficiencies in the muscular layer beneath an intact mucosal surface. When a child exhibits symptomatic velopharyngeal insufficiency (hypernasality) and recurring otitis media from poor Eustachian tube function, surgical repair (palatoplasty) is indicated to restore normal anatomic relationships. Tonsillectomy may help airway issues but does not correct a defective palate. Simple observation is insufficient if speech and middle-ear health are compromised. Frenectomy addresses ankyloglossia (tongue-tie) rather than a palatal defect. Palatoplasty can significantly improve speech quality and reduce the risk of persistent ear problems.

21. (B) A demineralization of tooth structures due to bacterial acid production

Dental caries is characterized by the progressive dissolution of enamel and dentin triggered by acidic byproducts of bacterial metabolism. Oral bacteria, most notably Streptococcus mutans, ferment carbohydrates to produce acids that reduce pH. This environment causes mineral loss from the tooth surface. Over time, lesions can expand into dentin and potentially approach the pulp if not addressed. Caries is not caused by Staphylococcus aureus, nor does it specifically indicate pulp hyperplasia or periodontal ligament inflammation. Its hallmark is the acid-mediated destruction of mineralized tooth structures.

22. (A) Streptococcus mutans

Streptococcus mutans is widely recognized for its leading role in the initial stages of caries. By metabolizing fermentable carbohydrates into lactic acid, this bacterium demineralizes enamel. Lactobacillus species contribute to progression once the lesion advances into dentin. Actinomyces israelii is linked to cervicofacial actinomycosis, whereas Porphyromonas gingivalis is implicated in periodontal disease. Hence, S. mutans remains the primary culprit for early caries initiation due to its robust acidogenic and aciduric capabilities.

23. (C) By buffering acids and supplying remineralizing ions

Saliva serves as a defense against caries through its bicarbonate buffering system, which neutralizes acids in the oral cavity. It also provides calcium and phosphate ions that facilitate enamel remineralization. The washing action of saliva helps clear away food debris and sugars, reducing the substrate for acidogenic bacteria. Proteolytic enzymes do not directly counteract caries, and removing the acquired pellicle would expose enamel surfaces more readily to bacterial adhesion. Instead, saliva sustains a pH and ionic environment conducive to maintaining tooth integrity.

24. (C) Fluoride exposure

Several factors potentiate caries: frequent sugar intake gives bacteria ample fermentable substrates; low salivary flow reduces the oral cavity's natural buffering and cleansing capacity; and acidogenic bacteria (e.g., Streptococcus mutans) generate acids that erode tooth minerals. Fluoride exposure, however, is protective rather than contributory to caries. Fluoride bolsters remineralization and forms fluorapatite, which is more resistant to acid demineralization. Thus, among the listed options, fluoride does not heighten caries risk but helps mitigate it.

25. (A) Enamel lesions progress slower; dentin lesions progress faster due to lower mineral content

Enamel, composed of roughly 96% mineral content, offers a robust barrier against acid attack, so caries typically advance more slowly through enamel. Once the lesion breaches the dentinoenamel junction, progression accelerates because dentin contains fewer minerals (~70%) and multiple tubules that facilitate bacterial spread. Consequently, while enamel requires prolonged acid exposure to demineralize significantly, dentin's relatively lower mineral content makes it more vulnerable. The incorrect viewpoint is that enamel is less mineralized or that both tissues demineralize at a uniform rate.

26. (B) Community water fluoridation

Fluoridating community water supplies is one of the most cost-effective and impactful measures to prevent dental caries in the general population. The consistent, low-level presence of fluoride bolsters tooth mineralization and curbs demineralization. While radiographic screening can aid in early detection, it does not itself prevent

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caries. Antibiotics are neither routinely prescribed for prophylaxis against caries nor advisable in that role. High-protein diets do not specifically address the acidogenic process behind tooth decay. Community water fluoridation stands out for its broad, preventative benefit.

27. (B) Replace fermentable carbohydrates with xylitol-based products

Xylitol is a sugar alcohol that oral bacteria (like Streptococcus mutans) cannot metabolize efficiently to produce acids, helping lower the cariogenic challenge in the mouth. Frequent snacking and sticky candies perpetuate low pH conditions conducive to demineralization. Limiting water intake hampers the natural cleansing and pH-buffering properties of saliva. Therefore, substituting xylitol for regular sugars—combined with sufficient oral hygiene—decreases the overall acid load on the teeth and lessens the likelihood of caries progression.

28. (C) Topical fluoride application

Incipient lesions confined to enamel can often be remineralized if addressed promptly. Topical fluoride in varnish or gel form promotes incorporation of fluoride ions into the tooth structure and deters demineralization. Placing restorations or crowns is indicated when lesions have cavitated or the structural integrity is compromised. Extraction is a last resort for teeth beyond repair. Therefore, a conservative, noninvasive approach—namely topical fluoride application plus improved oral hygiene—can halt or even reverse a demineralizing but non-cavitated lesion.

29. (B) Dental plaque biofilm formation on the acquired pellicle

After cleaning, tooth surfaces rapidly develop an acquired pellicle composed of salivary glycoproteins. Cariogenic bacteria, especially Streptococcus mutans, adhere to this film, forming a biofilm (dental plaque). The biofilm environment permits local acid production and accumulation, promoting caries. A high saliva pH counters acid formation, while excessive enamel mineralization would theoretically resist bacterial colonization. Systemic antibiotic use can temporarily reduce certain oral bacteria but does not typically prevent plaque formation. Hence, plaque biofilm on the pellicle is pivotal to bacterial adherence.

30. (D) Fluoride has no effect on bacterial metabolism

Fluoride benefits teeth by both promoting remineralization and inhibiting bacterial processes. When fluoride is present, it can reduce the acid production of cariogenic bacteria and form fluorapatite, a crystal more resistant to acidic attacks than hydroxyapatite. Excess fluoride exposure may cause fluorosis, manifesting as enamel mottling. Thus, the statement claiming fluoride does not influence bacterial metabolism is incorrect; fluoride can hinder key enzymes in bacterial glycolysis. By lowering the acids produced, fluoride offers dual protection against caries.

31. (C) Gingival recession exposing cementum

Root caries predominantly affect surfaces below the cementoenamel junction. As people age or develop periodontal disease, the gingiva may recede, exposing cementum, which is less mineralized and more susceptible to acid. A robust salivary flow and use of fluoridated toothpaste both reduce caries risk. Well-contoured gingival margins typically help prevent plaque accumulation. When the roots are uncovered, however, bacteria readily colonize and can demineralize cementum, increasing the incidence of root surface caries.

32. (C) Lowered oral pH

When sugary foods and drinks are frequently consumed, oral bacteria metabolize these carbohydrates to produce organic acids, such as lactic acid. This lowers the pH in dental plaque, promoting tooth demineralization. Saliva attempts to buffer these acids and restore a neutral pH, but constant exposure from repeated sugar intake overwhelms this protective mechanism. Enamel remineralization requires higher pH, whereas repeated exposure to acid fosters bacterial proliferation, not apoptosis. Thus, the immediate and direct result of frequent sugar ingestion is a persistently lowered oral pH.

33. (B) Topical fluoride application

White spot lesions indicate early, non-cavitated enamel demineralization that can be halted or reversed with topical fluoride. Fluoride varnish or

gel helps replenish tooth minerals and strengthens the enamel. Although fissure sealants protect occlusal surfaces on posterior teeth, they will not address incipient interproximal lesions in anterior teeth. Antibiotics are not standard caries prophylaxis, and orthognathic surgery is irrelevant for basic caries management. Thus, combined with dietary modifications and improved oral hygiene, topical fluoride therapy is crucial for preventing progression of these developing lesions.

34. (B) Radiation caries due to reduced salivary flow

Radiation therapy to the head and neck frequently damages salivary glands, leading to xerostomia. Lacking saliva's buffering, cleansing, and remineralization capabilities, teeth become highly susceptible to acid attack. This phenomenon is termed "radiation caries," often manifesting near the cervical region. Sialolithiasis involves salivary stones, not typical in radiation-induced dryness. Gingivitis is inflammation of the gum tissue. High fluoride exposure generally lessens caries risk. Therefore, the reduced salivary flow from radiation is the primary culprit in this rapid cervical caries presentation.

35. (B) Every 3 to 6 months

Patients at elevated risk for caries—due to factors such as frequent sugar intake, low saliva flow, or prior caries history—benefit from more frequent topical fluoride. Professional fluoride varnish every 3 to 6 months can maintain a favorable oral environment that resists demineralization. Annual or biennial fluoride applications may be inadequate for high-risk individuals. Applying varnish only when cavitation is visible fails to provide the ongoing preventive effect needed to curb lesion formation. Thus, shorter intervals for fluoride treatments help protect susceptible teeth.

36. (C) 10%

The World Health Organization recommends that free sugars (those added to foods and beverages, as well as those naturally present in honey and fruit juice) constitute less than 10% of total daily energy intake to reduce dental caries and other health risks. Dropping below 5% can offer additional benefits but is more challenging for many populations. Exceeding 10% fosters repeated acidic episodes in the mouth, contributing to enamel demineralization. Adhering to this guideline helps limit acidogenic bacterial activity and lowers overall caries incidence.

37. (B) Caries prevalent in all first molars with enamel defects

When multiple teeth that developed concurrently—such as the first permanent molars—show uniform enamel defects and caries, it points to a possible systemic insult during tooth formation. Nutritional deficiencies, childhood illnesses, or imbalances (including fluoride) can compromise enamel mineralization, leading to simultaneous vulnerability across these teeth. Local factors usually result in a pattern reflective of plaque stagnation sites. A single tooth or posterior-only decay more likely stems from localized plaque retention. Even patients who brush daily can have caries due to suboptimal technique or other local issues, so a widespread pattern of enamel defects prompts deeper systemic investigation.

38. (B) An opaque, whitish spot lesion that feels rough when the tooth is dry

Early enamel lesions often manifest as chalky-white, opaque spots that appear dull or matte and may feel slightly rough when air-dried. This indicates a porous, demineralized surface. Brown discoloration that is hard suggests an arrested lesion. A smooth, polished surface near the gingiva typically lacks active demineralization, possibly reflecting remineralization or abrasion. Black staining in a pit can indicate an arrested lesion or extrinsic stain, not necessarily an active carious process. Therefore, a rough, whitish spot that loses luster upon drying is a hallmark of an active, non-cavitated lesion.

39. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Dental sealants are resin-based protective coatings applied to pits and fissures on the biting surfaces of molars. By sealing these intricate grooves, sealants physically block bacterial ingress and carbohydrate accumulation, preventing acid attack. Their successful placement correlates with a lowered incidence of occlusal caries. Hence, the assertion that sealants lower caries risk is correct, and the reason—that they inhibit bacterial colonization

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in those susceptible pits—accurately explains the mechanism of their protective effect.

40. (C) Remineralization therapy and monitoring

Minimal intervention dentistry prioritizes preserving healthy tooth structure. If the lesion is not deeply cavitated and primarily affects the superficial dentin, remineralization strategies (e.g., topical fluoride, dietary advice) can halt progression. Regular follow-up ensures that the lesion remains stable or recalcifies. Full coverage crowns and pulpotomy are excessive for a mildly progressing lesion without pulp involvement, while extraction is reserved for teeth beyond restoration. Thus, a conservative approach employing remineralization therapy and vigilant monitoring aligns with the minimal intervention philosophy for early to moderate carious lesions.

41. (D) Abfraction

Abfraction presents as wedge-shaped lesions along the cervical regions of teeth, thought to result from flexural forces and microfractures in enamel at the neck of the tooth. Attrition involves tooth-to-tooth contact on occlusal or incisal surfaces. Abrasion occurs due to mechanical wear (e.g., from aggressive brushing), while erosion is chemical dissolution by acids not originating from bacteria. Abfraction lesions can be sensitive, but their signature form at the cervical site—and the presumed role of occlusal stress—distinguishes them from other non-carious lesions.

42. (C) Untreated deep carious lesion

Deep carious lesions that extend into the dentin and approach or invade the pulp chamber cause severe inflammation (pulpitis). If the pulp is not debrided or protected, the ongoing bacterial insult can compromise blood supply, leading to pulp necrosis. Pulp hyperemia can be an early sign of reversible pulpitis but does not always end in necrosis if managed. Chronic mild gingivitis affects the soft tissues around the tooth rather than the pulp. Routine scaling cleans surfaces but does not induce pulp necrosis in a healthy tooth.

43. (B) An abscess is an acute collection of pus; a granuloma is a chronic inflammatory lesion

A periapical abscess usually presents with acute symptoms, swelling, pain, and purulent exudate, most commonly associated with a necrotic pulp and acute infection at the tooth apex. A periapical granuloma, on the other hand, arises as a chronic inflammatory lesion composed of proliferating fibroblasts and inflammatory cells. Both lesions develop in the setting of pulp necrosis, not in vital or reversible pulpitis scenarios. Microorganisms typically inhabit both conditions; the difference is that an abscess involves acute suppuration while a granuloma represents a more protracted, organized inflammatory response.

44. (C) Diffuse radiolucency around the apex

Acute apical periodontitis primarily manifests with sharp pain, sensitivity to percussion, and sometimes throbbing discomfort. It may also spread to form an acute alveolar abscess if pus accumulates. Radiographically, very early acute changes may not show a distinct radiolucency, or one might see a slight widening of the periodontal ligament space. A well-demarcated or diffuse radiolucency tends to appear later in the chronic stages, such as with a periapical granuloma or cyst. Hence, diffuse radiolucency at the apex is not an early feature of acute apical periodontitis.

45. (B) A radicular cyst contains a true epithelial lining; an abscess does not

A radicular cyst (or periapical cyst) arises from epithelial remnants (rests of Malassez) in association with necrotic pulp and chronic periapical inflammation. It is encapsulated by an epithelial lining. A periapical abscess, conversely, is a localized collection of pus that lacks a defined epithelial capsule. Both commonly result from pulp necrosis in non-vital teeth, so neither arises in vital pulp. Abscesses do contain bacteria, while cysts may have fewer active microorganisms but chronic inflammatory cells and fluid. Thus, the presence of an epithelial lining distinguishes radicular cysts from abscesses.

46. (C) Access opening, drainage, and root canal treatment

An acute periapical abscess in a necrotic tooth requires removing the source of infection. Establishing endodontic access allows drainage

of pus and decompression of the inflamed tissues, alleviating pain. Root canal therapy then debrides the infected pulp and seals the canal system. Antibiotics can be adjunctive but do not replace mechanical decontamination. Extraction may be considered if the tooth is unrestorable, but it is not the first choice when endodontic treatment is feasible. Merely placing a permanent filling traps infection without addressing the necrotic pulp or abscess.

47. (B) Bacterial plaque-induced inflammation

Chronic periodontitis arises when bacterial plaque accumulates in the gingival sulcus, triggering an inflammatory response that destroys collagen fibers and alveolar bone around the teeth. Over time, periodontal pockets deepen, and bone support diminishes. While fluoride helps prevent caries, it does not cause periodontal destruction. Systemic allergies are not the main culprits behind alveolar bone loss, and enamel hypoplasia affects tooth surfaces, not the supporting structures. Consequently, bacterial plaque-induced inflammation is the principal driver of alveolar bone loss in chronic periodontitis.

48. (A) Vital pulp response in the affected tooth

An acute periodontal abscess originates in a periodontal pocket and typically involves a tooth with a vital pulp. Testing with cold or electric pulp testers often reveals normal pulp function. Periapical abscesses, conversely, arise from necrotic pulp and show radiolucencies around the apex. Severe caries leading to pulp infection commonly underlies a periapical abscess, and radiographic changes typically appear at the root apex. Periodontal abscesses usually feature notable gingival or pocket inflammation, whereas periapical lesions may not directly affect the gingiva until they drain or spread.

49. (C) Reduction of periodontal pockets and control of inflammatory processes

Managing chronic periodontitis aims to preserve the dentition by reducing pocket depths, removing bacterial deposits (plaque, calculus), and controlling the host inflammatory response. Scaling and root planing, plus improved oral hygiene, are key elements of therapy. Teeth extraction is considered only if the teeth are non-restorable. Completely eradicating all oral bacteria is neither practical nor desirable, as normal flora maintain oral health. Root canal treatment addresses pulpal pathologies, not the periodontal ligament and alveolar bone. By controlling inflammation and minimizing pocket depth, clinicians can stabilize periodontitis and prevent further bone loss.

50. (B) Panoramic radiograph and periapical radiographs

Standard periodontal evaluation typically involves panoramic and periapical radiographs to assess the level of alveolar bone supporting the teeth. Periapical X-rays provide detailed views of individual teeth and the surrounding bone, while panoramic imaging gives an overall view of the jaws. CBCT offers advanced three-dimensional images but is reserved for complex or ambiguous cases. MRI is excellent for soft tissue imaging but is not routinely used for bony changes in periodontal disease. Ultrasonography of gingival tissues is not a standard diagnostic measure for quantifying alveolar bone loss.

51. (B) Self-limiting, painful ulcerations of non-keratinized oral mucosa

Aphthous ulcers, or canker sores, typically appear on movable (non-keratinized) mucosal surfaces, such as the buccal and labial mucosa or vestibule. They present as small, round or oval, painful ulcers with an erythematous halo and a yellowish or grayish base. While their exact etiology can involve immune dysregulation, stress, or nutritional factors, they are generally self-limiting and not bacterial in origin. Keratinized mucosa (e.g., attached gingiva, hard palate) is less commonly affected. The lesions spontaneously resolve in 7–14 days, distinguishing them from persistent or chronic inflammatory conditions.

52. (D) Submandibular gland

Sialolithiasis is the formation of calcified structures (sialoliths) within salivary ducts. The submandibular gland's duct (Wharton's duct) is most prone to stone formation due to its long, upward path and thicker, more alkaline saliva. The parotid gland (Stensen's duct) can also develop stones but less frequently. Sublingual and minor salivary glands are rarely involved. Symptoms often include painful swelling

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of the gland, especially during meals. Management may involve milking the stone out, surgical removal, or sialendoscopy. Early intervention can prevent chronic sialadenitis or glandular damage.

53. (B) Reactivation of latent herpes simplex virus in the trigeminal ganglion

Recurrent herpes labialis is caused by herpes simplex virus (usually HSV-1) that becomes latent in the trigeminal ganglion following a primary infection. When reactivated by triggers such as stress, sunlight, or immunosuppression, the virus migrates along sensory nerves to the lip or perioral skin, producing characteristic clusters of vesicles that evolve into ulcers. This latent-then-reactivation cycle underpins the clinical pattern of cold sores. Autoimmunity and bacterial or salivary gland etiologies do not drive recurrent herpes labialis, highlighting the key role of HSV latency and subsequent reactivation.

54. (D) Necrotizing form with bone exposure

Oral lichen planus typically presents as reticular (white lace-like striae), erosive (painful ulcerations), atrophic, or plaque-type lesions. Although severe erosive forms can cause significant discomfort, they do not progress to necrotizing lesions with bone exposure. Necrotizing ulcerative processes affecting bone (e.g., osteonecrosis) are associated with conditions like medication-related osteonecrosis of the jaw or radiation-induced necrosis rather than lichen planus. The reticular, erosive, and plaque variants are well-documented clinical manifestations of oral lichen planus, often managed with topical corticosteroids or other immunomodulatory agents.

55. (C) Major aphthae exceed 1 cm in diameter and may scar

Aphthous ulcers are commonly categorized into minor, major, and herpetiform types. Minor aphthae measure less than 1 cm, heal in about 1–2 weeks, and generally do not scar. Major aphthae, however, can exceed 1 cm, persist longer (up to several weeks), and often result in scarring after healing. Both types can occur on non-keratinized mucosal surfaces, not restricted to the dorsal tongue. Herpetiform aphthae, in contrast, present as numerous small ulcers that coalesce. The key distinctions are size, healing time, and potential for scarring.

56. (B) Watchful waiting and biopsy only if symptoms develop or if appearance changes

Bilateral reticular lichen planus often appears as asymptomatic, lace-like Wickham's striae on the buccal mucosa. When lesions are asymptomatic and characteristic, clinicians typically opt for observation and regular follow-up. Biopsy is warranted if the lesions exhibit suspicious changes, become painful, or fail to match the expected presentation. Aggressive treatments—like wide surgical excision or high-dose steroids—are unnecessary unless there is erosive or symptomatic disease. Antibiotic therapy targeting oral bacteria is not relevant for this immune-mediated condition. Therefore, conservative management with periodic evaluation is the most appropriate approach.

57. (C) Geographic tongue

Geographic tongue (benign migratory glossitis) presents with multiple erythematous patches missing filiform papillae, often outlined by a white, raised border. These lesions migrate over days or weeks, giving a constantly changing pattern. Patients may experience burning or sensitivity to spicy or acidic foods. Leukoplakia typically presents as white plaques that do not scrape off, while erythroplakia is a persistent red patch with significant malignant potential. Traumatic ulcers are focal and do not migrate. Geographic tongue is usually benign and may require symptomatic relief only if discomfort arises.

58. (C) Surgical excision of the lesion, including the associated minor salivary gland

Mucoceles frequently result from trauma or obstruction of a minor salivary gland duct, leading to fluid buildup in the submucosal tissue. While small mucoceles occasionally resolve spontaneously, persistent or symptomatic ones typically require surgical excision. Removal includes the mucous sac and the glandular tissue to prevent recurrence. Simple saline rinses might provide palliative relief but do not eliminate the lesion. Corticosteroids are generally not indicated. A full-thickness lip wedge resection is excessive; targeted excision of

the mucocele and gland is sufficient and preserves normal lip contours.

59. (B) Suprabasilar acantholysis with intraepithelial bullae

Pemphigus vulgaris is an autoimmune blistering disorder in which autoantibodies target desmogleins (desmosomal proteins), causing keratinocyte detachment (acantholysis). The classic finding is suprabasilar acantholysis, leaving a row of basal cells ("tombstone" appearance) attached to the basement membrane, but the remainder of the epithelium detaches to form intraepithelial bullae. Subepithelial blistering with linear IgG is typical of mucous membrane pemphigoid, and granular IgA deposition at dermal papilla tips is consistent with dermatitis herpetiformis. Hyperkeratosis alone does not define pemphigus. Hence, suprabasilar acantholysis is pathognomonic.

60. (C) It is a malignant neoplasm of the salivary glands

Sjögren's syndrome is an autoimmune condition that primarily targets exocrine glands, especially salivary and lacrimal glands, causing xerostomia (dry mouth) and keratoconjunctivitis sicca (dry eyes). Many patients exhibit bilateral parotid gland swelling and may have positive rheumatoid factor or anti-SSA/anti-SSB antibodies. Although patients with Sjögren's have an elevated risk for lymphoma, Sjögren's syndrome itself is not a malignant neoplasm. Chronic inflammation of the salivary glands can predispose to lymphoma but does not equate to a primary malignant salivary gland tumor.

61. (B) Postmenopausal women over 50 years old

Mucous membrane pemphigoid (MMP) is a chronic subepithelial blistering disorder that often involves the oral mucosa, and occasionally the conjunctiva or other mucosal sites. It predominantly affects older adults, with a higher prevalence in women, particularly postmenopausal individuals over 50. This condition differs from pemphigus vulgaris, which can present across a broader age range. MMP's subepithelial separation spares the deeper lamina propria, making the disease typically less fragile than pemphigus vulgaris, but it can lead to scarring. Children, adolescents, and young males are less frequently affected.

62. (C) Persistent fungal colonization beneath ill-fitting dentures

Chronic atrophic candidiasis (often called denture stomatitis) appears on the mucosal surface where dentures rest, typically the palate. It arises when Candida species proliferate under conditions of reduced salivary flow, poor denture hygiene, or an ill-fitting denture that traumatizes the mucosa. This environment promotes fungal overgrowth and inflammatory changes in the underlying tissue. While deficiencies in nutrition or other infections can contribute to mucosal issues, denture stomatitis specifically ties to Candida colonization on denture surfaces or fitting areas. Regular denture cleaning, adequate fit, and antifungal therapies are key interventions.

63. (A) Sjögren's syndrome

Sjögren's syndrome is characterized by autoimmune involvement of exocrine glands, particularly salivary and lacrimal glands, causing xerostomia (dry mouth) and keratoconjunctivitis sicca (dry eyes). Bilateral parotid enlargement often occurs. Anti-SSA (anti-Ro) and anti-SSB (anti-La) are frequently detected. In contrast, scleroderma primarily involves skin thickening and systemic fibrosis, sarcoidosis can cause noncaseating granulomas and parotid swelling but not typically anti-SSA, and primary biliary cirrhosis affects the liver's small bile ducts. Thus, anti-SSA positivity plus hallmark glandular symptoms strongly suggests Sjögren's syndrome.

64. (C) Intercellular IgG antibodies against desmogleins

This clinical picture—painful oral erosions, flaccid bullae, positive Nikolsky sign, and suprabasilar acantholysis—aligns with pemphigus vulgaris. The immunopathology involves IgG autoantibodies directed against desmosomal proteins (desmoglein 3, and sometimes desmoglein 1), leading to intercellular separation (acantholysis). By contrast, linear IgG at the basement membrane is typical of mucous membrane pemphigoid, granular IgA in the lamina propria indicates dermatitis herpetiformis, and IgE-mediated mast cell activation is associated with allergic-type reactions. Pemphigus vulgaris remains distinguished by its hallmark intercellular IgG deposition and suprabasilar split.

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65. (C) Topical corticosteroids or immunosuppressants

Erosive lichen planus can produce significant discomfort, ulcerations, and a risk of secondary infection. First-line therapy typically involves topical corticosteroids (like fluocinonide gel) to alleviate inflammation and facilitate healing. In refractory cases, immunosuppressive agents (e.g., tacrolimus) may be added. Antibiotics have no direct role in treating an immune-mediated process, and routine surgical excision is not indicated unless suspicious malignant transformation is suspected. Some patients with purely reticular, asymptomatic lesions require only observation, but erosive and symptomatic variants benefit from anti-inflammatory or immunomodulatory measures for symptom relief.

66. (C) Human teeth always produce perfectly reproducible bite patterns

Bite mark evidence is subject to considerable scrutiny because skin is elastic and can distort, especially under swelling or post-injury movement. Environmental factors—like washing, healing, or contamination—may blur the mark, weakening its clarity. Different experts can interpret pattern similarities with varying degrees of confidence, leading to disagreement. However, the claim that human teeth "always produce perfectly reproducible bite patterns" is incorrect. Biological variation in force application and skin elasticity means no two bites are precisely the same. Consequently, a rigid expectation of perfect duplication is flawed, prompting careful and cautious forensic interpretation.

67. (C) The suspect's saliva is deposited on a single thin clothing layer

Recovering saliva-based DNA from clothing depends on how much fluid penetrates the fabric and whether the garment is well-preserved until testing. Biting through multiple fabric layers often disperses saliva, reducing the concentration in any single spot. Rainfall or washing can dilute or destroy genetic material. Moreover, the item must be collected and stored properly to prevent contamination or degradation. If the suspect's saliva is left on a single thin layer, and that garment is carefully secured, forensic scientists have a higher chance of extracting a testable DNA sample that might match the suspect.

68. (C) Eruption timelines, though culturally modifiable, usually follow a predictable pattern

Children's dentition undergoes a generally predictable sequence of events: deciduous (baby) teeth emerge, eventually exfoliate, and are replaced by permanent teeth in specific chronological windows. While minor ethnic and nutritional factors can shift eruption times, broad developmental milestones remain consistent enough to approximate age. Deciduous teeth do not appear randomly, and permanent eruption sequences are not truly identical among all populations but still follow typical ranges. This predictability allows forensic odontologists to compare a child's dentition stage with standard charts, offering a reasonable age estimate, especially when combined with other developmental data.

69. (C) Matching the labeled dentures with the patient's known dental records

In cases where an individual cannot communicate, labeled dentures provide a direct lead toward identification if cross-referenced with existing dental or laboratory records. Dental records for removable prostheses often detail the date of fabrication, the name or initials inscribed, and key technical specifications such as the occlusal scheme or base design. While DNA from the denture's surface could support the ID, the simplest and most immediate approach is comparing the labeling to the dentist's official documentation. Fingerprint comparison is irrelevant if we already have a labeled prosthesis, and a mandibular bone biopsy is unnecessarily invasive under these circumstances.

70. (D) A corresponding rectangular notch matching the suspect's fractured incisor

If the security guard's bite mark presents a rectangular indentation aligning precisely with the suspect's fractured upper right lateral incisor, it creates a compelling link between the individual's dentition and the wound. Forensic dentists examine how broken or misshapen teeth might transfer distinctive shapes onto skin. Superficial scratches, negative saliva tests, or generally blurred impressions lack the specificity to reliably identify a biter. Noting a near-perfect correlation between a unique tooth fracture and the bite mark's outline

offers strong, case-defining evidence, especially if supported by additional data like suspect DNA from the wound.

71. (B) Using a standardized scale (e.g., ABFO No. 2) placed at skin level

Standardized forensic photography of bite marks requires including a recognized scale—commonly the American Board of Forensic Odontology (ABFO) No. 2—positioned in the same plane as the lesion. This provides precise dimensional reference for measuring the arc length, tooth spacing, and other features. The camera lens should be perpendicular to the wound to minimize distortion, and images must be clearly focused to capture fine details. Omitting a scale complicates later comparisons, while incorrect angles or artificially manipulating skin can distort the mark. Adhering to these photographic principles ensures reliable, court-admissible bite mark documentation.

72. (D) Using bleach on the wound prior to swabbing improves DNA yield

Collecting salivary DNA from a bite mark involves carefully swabbing the area as soon as possible, preferably before cleaning or contamination sets in. The technique should be sterile and gentle, maintaining sample integrity and preventing cross-contamination with external materials. DNA degrades over time, especially when exposed to environmental factors such as moisture, bacteria, or temperature changes. Applying bleach or other chemical disinfectants before swabbing, however, does not improve yield—in fact, it can destroy or degrade DNA, rendering the sample unusable. Hence, statement (D) is incorrect and contrary to proper forensic practices.

73. (B) They provide unique canal or restoration configurations that remain visible postmortem

When antemortem radiographs capture distinctive endodontic fillings, unusual root shapes, or specific restorative work, these features often persist after death. Teeth with root canals or large restorations tend to maintain recognizable shapes of gutta-percha or fillings, even if the surrounding tissues decompose or burn. By comparing these postmortem findings to the old radiographs, forensic dentists can confirm a match. Although alveolar bone changes may occur over time, the essential three-dimensional arrangement of canal obturation or restorative outlines typically remains. Consequently, older radiographs containing these unique details provide a robust link to an individual's past dental treatments.

74. (B) Demonstrate each crown and implant position matches antemortem records

Dental implants and crowns often involve a unique arrangement and documented procedures. If the victim's known dentist has records specifying implant brand, size, location, and abutment angles—as well as crown shapes or materials—postmortem examination of the mouth can confirm these precise details. Linking each crown or implant site to the documented chart provides a strong identification chain, effectively refuting claims that the victim is someone else. Merely discarding crowns or comparing footprints does not address the direct forensic question, and partial fingerprint data might not be as definitive as matching complete dental interventions.

75. (B) Assign separate identifiers to each fragment and record distinctive features or restorations

When dealing with fragmented remains in a mass-casualty scenario, maintaining orderly collection and documentation is essential. Each bone or dental piece gets a unique label so its provenance is traceable. Detailed notes—such as the presence of restorations, root shapes, or partial alveolar ridges—allow subsequent comparison with antemortem data. Commingling fragments in a single container without labeling risks mixing individuals' remains, compromising identification. Corrosive cleaning agents may destroy morphological details or hamper future DNA extraction. Even fragments lacking teeth might still reveal alveolar patterns, old extractions, or sinus contours critical to confirming identity.

76. (B) Pleomorphic adenoma

Pleomorphic adenoma, often called "benign mixed tumor," is the most common benign salivary gland neoplasm. It comprises epithelial and myoepithelial cells embedded in a stromal (fibromyxoid) background. Mucoepidermoid carcinoma and adenoid cystic carcinoma are malignant. Warthin

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tumor (papillary cystadenoma lymphomatosum) is a benign lesion characterized by cystic spaces and lymphoid stroma, but it lacks the diverse mesenchymal-like components seen in pleomorphic adenoma. Although typically benign, pleomorphic adenomas can undergo malignant transformation if left untreated for a prolonged duration.

77. (A) Papilloma

Oral squamous papilloma (often HPV-related) is a benign proliferation of stratified squamous epithelium, classically displaying a papillary or verrucous surface resembling a cauliflower. Lipomas originate from adipose tissue, hemangiomas from blood vessels, and odontomas from dental tissues (enamel, dentin). The characteristic exophytic fronds of squamous papillomas distinguish them clinically from other benign lesions. Though painless, they can be removed if they cause functional or esthetic concerns or if there is any suspicion of dysplastic change.

78. (B) Invasion through the basement membrane

Carcinoma in situ involves full-thickness epithelial dysplasia without breaching the basement membrane. Once malignant cells infiltrate beyond that membrane into underlying connective tissue, the lesion is classified as invasive squamous cell carcinoma. Keratin pearls are common in well-differentiated squamous cell carcinoma but may also appear in situ if differentiation is pronounced, yet the critical shift is basement membrane penetration. In carcinoma in situ, dysplasia spans the entire epithelial thickness, not merely the basal layer, but lacks invasion. Hence, crossing the basement membrane signals a transition to invasive cancer.

79. (D) Invariably well-differentiated histology

Oral tongue squamous cell carcinoma often appears as a persistent ulcer, mass, or exophytic lesion, potentially painless in early stages. It is known for aggressive local invasion and a strong likelihood of early cervical lymph node spread, particularly the lateral border lesions. Histopathologically, oral SCC can span from well-differentiated to poorly differentiated; it is not invariably well-differentiated. Many tumors show varied degrees of differentiation, and poorly differentiated forms often portend a worse prognosis. Thus, the claim that these neoplasms are uniformly well-differentiated is incorrect.

80. (C) Verrucous carcinoma displays a warty exophytic growth with minimal dysplasia and low metastatic potential

Verrucous carcinoma is a well-differentiated variant of SCC that grows exophytically, featuring a papillary or warty surface with minimal cytologic atypia. Despite local invasiveness, it rarely metastasizes, giving it a more favorable prognosis. Conventional SCC exhibits a broader spectrum of histologic differentiation and a higher propensity for regional or distant spread. Keratin production is evident in both forms of squamous neoplasia, and verrucous carcinoma can occur on gingiva, buccal mucosa, or other keratinized surfaces—not exclusively in minor salivary glands. Its hallmark is slow growth and low metastatic risk.

81. (A) Betel nut (areca) and tobacco chewing

In South Asian regions, the practice of chewing betel nut (areca nut) mixed with tobacco, slaked lime, and other ingredients is strongly associated with oral squamous cell carcinoma. Chronic irritation and carcinogens within areca and tobacco contribute to dysplastic changes, especially on the buccal mucosa and gingivobuccal sulcus. Betel quid usage also relates to submucous fibrosis, a premalignant condition. A high-fiber diet does not elevate oral cancer risk. Excessive brushing or fluoride mouthwashes do not cause malignancy. Thus, areca and tobacco chewing remains a dominant regional etiological factor.

82. (A) Bilateral or multifocal involvement

Warthin tumor (papillary cystadenoma lymphomatosum) is a benign salivary gland tumor often found in the parotid gland. It typically presents as a slow-growing, painless mass in older adults, frequently in smokers. Approximately 5–10% of cases may be bilateral or multifocal. Despite possible multifocality, it rarely transforms into a high-grade malignancy. Rapid ulceration of skin suggests aggressive malignant processes. Warthin tumor is uncommon in children, who more often present with other salivary pathologies. Therefore, bilateral or multifocal presentation is a notable clinical feature specific to Warthin tumors.

83. (B) MRI or appropriate imaging followed by superficial parotidectomy

Pleomorphic adenomas require complete surgical removal to prevent recurrence or possible malignant transformation. Imaging (often MRI or ultrasound) helps delineate tumor extent. An incisional biopsy in the parotid region risks seeding tumor cells or causing facial nerve damage. Chemotherapy or radiation alone is not standard for benign salivary tumors. Superficial parotidectomy (or total parotidectomy if the tumor is deep-lobe) ensures complete excision with preservation of the facial nerve unless it is directly involved. Following imaging confirmation, surgical resection remains the mainstay of definitive management.

84. (B) Cribriform or "Swiss cheese" pattern

Adenoid cystic carcinoma characteristically exhibits a cribriform pattern resembling Swiss cheese, created by small, uniform tumor islands with multiple cystic or gland-like spaces. This tumor is notorious for perineural invasion and a protracted, relentless course. Sheets of clear cells producing mucin often define mucoepidermoid carcinoma, whereas psammoma bodies occur in some papillary carcinomas (e.g., thyroid) but are not a hallmark of salivary gland malignancies. Spindle-shaped cells suggest mesenchymal or sarcomatous features, not typical of adenoid cystic carcinoma. The classic architecture is the cribriform, cylindromatous arrangement.

85. (C) Typically require wide excision with margins

Oral fibromas, or irritation fibromas, are benign reactive lesions most frequently found where chronic trauma occurs—like the buccal mucosa along the bite line. They feature fibrous hyperplasia due to repeated irritation, presenting as a small, painless nodule. Treatment involves conservative surgical excision, not extensive resection with wide margins, because these lesions do not behave aggressively. They are generally well-demarcated, and recurrence is uncommon if the source of trauma is addressed. Thus, the notion that they need wide oncologic margins is incorrect.

86. (B) Pleomorphic adenoma

Pleomorphic adenoma (benign mixed tumor) has a recognized, though relatively low, potential for malignant transformation over time—into carcinoma ex pleomorphic adenoma—especially if neglected for many years. Lipomas, oral papillomas, and traumatic fibromas rarely, if ever, undergo malignant transformation. Papillomas might occasionally show dysplastic changes if associated with high-risk HPV strains, but malignant conversion is still quite uncommon compared to long-standing pleomorphic adenomas. Eliminating or monitoring benign mixed tumors is crucial due to the potential for transformation into a more aggressive carcinoma.

87. (A) Epulis fissuratum

Epulis fissuratum appears as a hyperplastic fold of fibrous tissue in the vestibule, secondary to chronic rubbing or pressure from poorly fitting dentures. The lesion often forms multiple redundant tissue folds where the denture flange rests. Peripheral ossifying fibroma, pyogenic granuloma, and papillary hyperplasia (seen on the palate) relate to different reactive or proliferative processes, although they can also arise from irritation. However, epulis fissuratum is specifically associated with denture-induced friction, underlining the role of mechanical trauma in producing fibrous tissue overgrowth in the vestibular mucosa.

88. (B) Minimal cytologic atypia with broad pushing rete pegs

Verrucous carcinoma is a variant of squamous cell carcinoma exhibiting an exophytic, warty growth. Histologically, it displays wide, bulbous rete pegs that push into submucosa but demonstrate scant cytologic atypia. Despite being locally invasive, verrucous carcinoma seldom metastasizes early. Neurovascular invasion and infiltration of salivary glands are more consistent with higher-grade or conventional SCC. Chronic smokeless tobacco use can predispose to verrucous carcinoma in the buccal sulcus or gingiva, emphasizing the link between nicotine-containing products and oral malignancies.

89. (B) T2 N1 M0

According to the TNM classification, T2 typically indicates a tumor size greater than 1 cm but not

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exceeding 2 cm (although exact cutoffs can differ slightly by region; commonly T2 is up to 2 cm or sometimes up to 4 cm depending on guidelines). Here, we have a 2-cm lesion, which fits T2. N1 indicates ipsilateral lymph node involvement without contralateral or bilateral spread. M0 means no distant metastasis. T1 would be for tumors ≤1 cm, T3 for tumors >2 cm (or >4 cm in some classifications), and M1 signifies distant metastasis.

90. (C) Surgical resection plus adjuvant radiation or chemoradiation

Advanced-stage oral squamous cell carcinomas (larger tumors or those with extensive nodal involvement) typically require surgical removal of the primary lesion, possibly including partial mandibulectomy or maxillectomy and neck dissection, followed by adjuvant radiotherapy or chemoradiation to address microscopic residual disease and reduce recurrence risk. Radiation or chemotherapy alone is often insufficient for controlling bulk disease in advanced oral cancer. Observation is unwise for an aggressive malignancy that can rapidly progress. By combining surgery with adjuvant therapy, clinicians can optimize both local control and survival outcomes in advanced cases.

91. (B) Odontogenic keratocyst (OKC)

The odontogenic keratocyst develops from dental lamina remnants and is known for its characteristic keratinized epithelial lining. It can present in the mandible or maxilla, often in the posterior regions. OKCs tend to grow aggressively with a high recurrence rate if not completely excised. Nasolabial and globulomaxillary cysts are non-odontogenic, and the thyroglossal duct cyst arises from thyroid tract remnants. The distinctive keratinizing epithelium in an OKC, plus its frequent association with the nevoid basal cell carcinoma syndrome (Gorlin-Goltz), sets it apart from other jaw cysts.

92. (C) Globulomaxillary cyst

The globulomaxillary cyst was historically described as a fissural cyst between the maxillary lateral incisor and canine, creating a pear-shaped radiolucency. However, some debate surrounds its true embryologic origin. Clinically, it appears as a well-demarcated radiolucency that can cause divergence of the tooth roots. The nasopalatine duct cyst (incisive canal cyst) occurs near the palatal region behind the central incisors. A lateral periodontal cyst typically appears along the lateral aspect of a tooth root, and a dentigerous cyst envelops the crown of an unerupted tooth.

93. (B) Around the crown of an unerupted or developing tooth

Dentigerous cysts form between the reduced enamel epithelium and the crown of an unerupted (often impacted) tooth, typically third molars or maxillary canines. They attach at the cementoenamel junction and can expand, resorbing adjacent bone. They are the second most common odontogenic cyst after radicular cysts. Maxillary sinus mucosal cysts are unrelated to developing tooth structures. Thyroglossal tract remnants produce thyroglossal duct cysts, and supernumerary tooth buds might be associated with extra tooth development but not specifically cause dentigerous cysts. Hence, an unerupted tooth crown is the essential feature.

94. (C) Nasolabial cyst

Odontogenic cysts arise from tooth-forming tissues or their remnants. Radicular cysts originate at the apex of non-vital teeth, dentigerous cysts surround crowns of unerupted teeth, and odontogenic keratocysts develop from dental lamina. The nasolabial cyst is a soft tissue, non-odontogenic cyst in the nasolabial fold region, not related to tooth formation. It does not appear on radiographs unless it displaces structures and has no direct relationship to the teeth themselves. Therefore, nasolabial cyst is excluded from the odontogenic group.

95. (B) A residual cyst is left behind after an extraction, whereas a radicular cyst is at the apex of a non-vital tooth

A radicular cyst (periapical cyst) arises from the apex of a tooth with necrotic pulp and chronic periapical inflammation, often forming epithelium-lined cavities. If such a cyst persists in the jaw after the offending tooth is extracted (and the cyst is not removed), it is then called a residual cyst. They share similar inflammatory origins and can look histologically alike, but their clinical context differs. Residual cysts occupy an edentulous area

where a tooth once was; radicular cysts are attached to a non-vital tooth apex.

96. (C) Surgical enucleation of the cyst with removal of the impacted tooth

Dentigerous cysts can grow expansively, risking bone destruction and displacement of adjacent structures. Standard treatment involves surgically enucleating the cyst lining and usually extracting the associated impacted tooth. Marsupialization may be an option in certain large lesions to decompress the cyst before definitive surgery, but enucleation plus tooth removal remains definitive. Antibiotics address infection but do not eliminate the cyst lining. Radiation therapy is not indicated for benign odontogenic cysts and carries risks of osteoradionecrosis. Simple observation is inappropriate for a progressively expanding lesion.

97. (A) Traumatic bone cyst (simple bone cyst)

The traumatic bone cyst or simple bone cyst is not a true epithelial-lined cyst but rather a cavity within the bone, often showing a scalloped radiolucency between tooth roots. Patients are frequently asymptomatic, and the lesion may be discovered incidentally on radiographs. Aspiration or surgical exploration reveals an empty or fluid-containing cavity without an epithelial lining. Radicular cysts typically center around a non-vital tooth apex, nasopalatine duct cysts are anterior maxillary midline lesions, and Stafne defect (static bone cyst) appears below the mandibular canal near the submandibular gland region.

98. (A) Placement of bone graft material and closure

After confirming a traumatic bone cyst, surgeons typically curette the bony walls to stimulate bleeding and subsequent healing. They may place autologous or alloplastic bone graft material before closing the site. Over time, the cavity fills with new bone. Steroids, chemotherapy, or large resections are unwarranted, as this is a benign lesion lacking an epithelial component. Mere surgical intervention to freshen the cavity walls and encourage healing suffices. Some clinicians simply induce bleeding without grafts, but grafting can help consolidate the defect more reliably, especially if significant expansion existed.

99. (B) A well-defined radiolucency at the midline between and apical to the central incisors

The nasopalatine duct cyst (incisive canal cyst) is a developmental cyst located in the incisive canal area. On radiographs, it appears as a round or ovoid radiolucency in the midline behind the maxillary central incisors, often measuring greater than 6 mm. Vitality tests on adjacent teeth usually confirm their viability, differentiating this cyst from a radicular cyst of non-vital incisors. Bilateral lesions in the premolar area suggest other cysts (e.g., lateral periodontal or other), while a radiopaque mass is uncharacteristic for a nasopalatine duct cyst.

100. (C) They are never associated with nevoid basal cell carcinoma syndrome

Odontogenic keratocysts can display aggressive growth and a notable recurrence rate, especially if the thin, friable lining is not entirely removed. Histologically, they exhibit a parakeratinized epithelial lining. They are often found in the posterior mandible and ramus region. Moreover, multiple OKCs may be linked to nevoid basal cell carcinoma syndrome (Gorlin-Goltz syndrome), featuring mutations in the PTCH1 gene. Therefore, the claim that they are "never associated" with that syndrome is incorrect. Their known syndromic relationship underscores the importance of thorough evaluation and follow-up.

101. (B) A white patch that cannot be rubbed off or attributed to any specific disorder

Oral leukoplakia is defined as a white patch or plaque that cannot be scraped away and cannot be classified as another identifiable lesion (e.g., candidiasis). By exclusion, once common causes of oral "whiteness" are ruled out, a clinical diagnosis of leukoplakia is made. It has a recognized premalignant potential, especially when displaying dysplastic changes histologically. Although not all leukoplakias transform into malignancy, vigilant examination and biopsy are warranted. Distinguishing it from red lesions (erythroplakia), known ulcers, or vesiculobullous processes is fundamental for accurate diagnosis.

102. (C) Erythroplakia

Erythroplakia, a red patch that cannot be attributed to another disorder, carries a notably higher risk

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of dysplasia or carcinoma than leukoplakia. Histological studies often reveal severe dysplasia, carcinoma in situ, or invasive squamous cell carcinoma in many erythroplakic biopsies. Oral submucous fibrosis poses significant malignant potential, but on a per-lesion basis, erythroplakia has an even greater likelihood to harbor or progress to malignancy. Frictional keratosis, induced by chronic trauma (e.g., sharp tooth edges), is generally reversible once the irritant is removed and is not considered a true premalignant lesion.

103. (B) Through progressive fibrosis leading to tissue hypoxia and genetic alterations

Oral submucous fibrosis (OSMF) is a chronic, progressive condition primarily related to areca nut chewing. The ongoing injury and fibrotic changes reduce vascularity and create a hypoxic microenvironment in the oral tissues. This hypoxia can induce genetic mutations in epithelial cells and diminish the mucosal protective mechanisms, raising the probability of dysplasia and malignant transformation. Although mechanical irritation may contribute initially, OSMF is driven largely by chemical and fibrotic processes. Over time, the rigid, fibrous tissues limit mouth opening and predispose to premalignant changes in the epithelium.

104. (D) Rapid spontaneous resolution without intervention

Oral submucous fibrosis typically does not resolve spontaneously. Instead, it tends to progress over time, leading to increasingly dense fibrous bands in the oral mucosa. Symptoms often include burning sensations when consuming spicy food, blanching or marbling of the mucosa, and reduced mouth opening (trismus). The disease process is chronic and may remain stable or worsen unless risk factors (particularly areca nut chewing) are removed. Even after cessation of habit, residual fibrosis often persists, meaning rapid, complete reversal is not typical. Management strategies mainly focus on halting progression and improving function.

105. (C) Erythroplakia appears as a red patch and is more likely to harbor dysplasia or carcinoma

Erythroplakia manifests as a red patch on the oral mucosa and, when biopsied, frequently reveals advanced dysplasia or early invasive carcinoma. Leukoplakia presents as a white patch or plaque, with a lower (though still significant) risk of malignant change. They have distinctly different clinical appearances: erythroplakia is typically described as a velvety red area, while leukoplakia is white or grayish. Stating that they cannot be visually differentiated is inaccurate; indeed, the color distinction is fundamental. Erythroplakia's higher malignant transformation rate is a key clinical concern.

106. (C) Excisional or incisional biopsy to assess for dysplasia

While removing local irritants and testing for candidiasis can be helpful in some cases, any persistent leukoplakic lesion—particularly one with suspicious features (e.g., thick or speckled areas)—requires histopathological evaluation. A biopsy (excisional if small, incisional if large) is the gold standard to confirm dysplasia or early malignancy. Merely observing a suspicious patch for a long duration risks progression of potential malignancy. Empirical antifungal measures may be tried if there is strong clinical suspicion of candidal leukoplakia, but negative response must lead to biopsy. Ultimately, tissue diagnosis is critical for definitive management.

107. (C) Complete cessation of areca nut chewing

Oral submucous fibrosis is strongly associated with the areca nut habit. The fibrogenic alkaloids and chemical irritants in areca nut perpetuate inflammation and fibrotic changes, causing progressive stiffness and reduced mouth opening. The most effective preventive measure is discontinuing the chewing habit. While steroids, intralesional hyaluronidase, or physiotherapy may provide symptomatic relief or slow progression, eliminating the etiologic factor is crucial. Antibiotics and antifungals do not address the fibrotic mechanism, and radical resection is not a first-line measure for early submucous fibrosis without malignant transformation.

108. (C) Appearance of red or speckled (erythroleukoplakic) areas

When a leukoplakic lesion develops red components—becoming erythroleukoplakia or "speckled leukoplakia"—the risk of dysplasia or

malignancy increases substantially. Such color changes often indicate progressive epithelial dysplasia. Homogeneous, smooth leukoplakias are generally lower risk, and a decrease in lesion size following habit cessation can imply resolution of mild hyperkeratosis. Even in the absence of known risk factors, new onset of an erythroleukoplakic area is worrisome. Clinicians should proceed with biopsy if suspicious changes appear, ensuring early detection of possible premalignant or malignant transformation.

109. (B) Malignant transformation of lichen planus is universally accepted

While longstanding lichen planus (especially erosive or atrophic variants) has shown a small, but recognized, risk for malignant transformation, the exact incidence and mechanisms remain somewhat controversial. It is not "universally accepted" that all lichen planus will transform; rather, certain subsets are more prone to malignant changes than others, and many patients never experience malignant progression. Nonetheless, close clinical monitoring and biopsy of persistent ulcers or suspicious areas are advisable. Reticular lesions pose lower risk. Thus, the claim that malignant transformation is universally acknowledged in every case is incorrect or overstated.

110. (C) Continued areca nut use

The fundamental driver of disease progression in oral submucous fibrosis is ongoing use of areca nut, which contains alkaloids and irritants that perpetuate inflammation and fibroelastic changes. When the habit persists, the epithelial tissue remains in a chronically stressed microenvironment, amplifying the risk for dysplasia and malignant transformation over time. Patient age, pain levels, and coexisting systemic illnesses may influence disease severity or management challenges, but they are less directly predictive of malignant conversion than the uninterrupted etiologic habit. Cessation of areca nut is vital to reduce malignant risk.

111. (B) Frictional keratosis that may mimic leukoplakia

Persistently rough tooth surfaces or ill-fitting dentures can provoke localized mucosal thickening—frictional keratosis—as the epithelium adapts to chronic mechanical trauma. Clinically, this area can appear white and may be mistaken for leukoplakia. However, frictional keratosis typically resolves or significantly improves once the irritant is removed. Genuine leukoplakia (premalignant) remains even after eliminating potential irritants. Erythroplakia involves red lesions not primarily due to mechanical trauma, while submucous fibrosis and erythema multiforme have distinct etiopathological factors. Thus, frictional keratosis is the direct effect of mechanical irritation.

112. (B) Speckled leukoplakia (erythroleukoplakia)

Speckled leukoplakia (erythroleukoplakia) is characterized by mixed red-and-white patches and carries a higher risk of dysplasia or malignant change than homogenous leukoplakia. A heavy, long-standing smokeless tobacco habit significantly increases the risk for such premalignant changes on the buccal mucosa. Lichen planus has a typically lacy, reticular appearance and may not directly correlate with tobacco habits. Erythema multiforme presents acute, often ulcerative lesions, frequently triggered by infections or medications. Hyperplastic candidiasis might be white but typically shows fungal hyphae and partial resolution with antifungal therapy.

113. (B) Discontinuation of betel quid and supportive treatments

Oral submucous fibrosis involves fibrotic changes in the oral mucosa from prolonged exposure to areca nut (betel quid). The cornerstone of management is eliminating the causative factor—betel quid chewing—to halt disease progression. Supportive or symptomatic treatments (e.g., intralesional steroids, hyaluronidase injections, mouth-opening exercises, occasionally surgical fibrotomy in severe cases) may alleviate trismus and burning. Radical resection is not indicated in non-malignant OSMF without significant functional compromise. Antibiotics and chemotherapy do not address the underlying fibrogenic process. Cessation of the habit and adjunct therapy remain paramount.

114. (B) Complete surgical excision or laser ablation

A small leukoplakic lesion with documented mild dysplasia warrants intervention to prevent possible progression. Surgical removal or laser ablation is often the definitive treatment, ensuring the

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dysplastic epithelium is eradicated and allowing histopathological examination of excised tissue margins. Watchful waiting could miss evolving malignancy, while radical procedures like total maxillectomy are excessive for a localized lesion. Radiation therapy is not a standard initial approach for small, localized premalignant lesions. Minimally invasive excision or ablation typically provides both diagnostic clarity and a therapeutic cure when margins are clear.

115. (C) Public health campaigns to eliminate areca nut and tobacco use

WHO-endorsed strategies emphasize controlling risk factors to curb oral cancers and their premalignant precursors. In regions where areca nut and tobacco chewing are prevalent, educational initiatives, cessation support, and community-level legislation can significantly reduce incidence. Antibiotics, monthly biopsies, or mandatory mouth guards do not address the root cause—the chemical and mechanical irritation from the betel quid or tobacco. Hence, a broad public health campaign focusing on habit cessation and awareness has the greatest impact on lowering rates of oral submucous fibrosis, leukoplakia, and subsequent malignant transformation.

116. (B) High-grade dysplasia or carcinoma in situ

The lateral tongue is a high-risk site for dysplasia and squamous cell carcinoma. When a speckled (white-red) lesion shows induration (hardness) at the base, especially in an older adult, the possibility of advanced dysplasia or carcinoma in situ is high. Benign frictional keratosis typically lacks induration and presents on buccal mucosa where mechanical trauma is common. Angular cheilitis appears at the lip commissures with erythema, cracking, and often fungal involvement, whereas minor aphthae are transient superficial ulcers with minimal induration. Thus, an indurated patch in this region warrants urgent biopsy.

117. (C) Transition to a malignant or severely dysplastic lesion

The development of an ulcer or erosive area within a previously homogeneous leukoplakic patch is a concerning sign. It often suggests progression to advanced dysplasia, carcinoma in situ, or invasive carcinoma. While benign trauma could cause superficial ulceration, persistent non-healing ulcers in a high-risk lesion typically reflect malignant transformation. Fungal superinfection may appear erythematous or cause surface changes, but a chronic ulcer in a leukoplakic area strongly warrants histopathological examination for possible malignant change. Early detection via biopsy is critical to prevent further invasive progression.

118. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Erythroleukoplakia (also called speckled leukoplakia) frequently shows severe dysplasia or carcinoma upon biopsy, making it more dangerous than a uniform white patch. The red component corresponds to areas of thinned or atrophic epithelium, allowing underlying blood vessels to show through. This atrophy, along with possible erosive changes, correlates with heightened dysplastic changes at the microscopic level. Therefore, the presence of erythroplakic features within a leukoplakic lesion significantly elevates malignant transformation risk, and the atrophic, vascular characteristic is indeed the main explanation for this higher risk.

119. (B) Surgical excision or laser ablation

The floor of the mouth is a high-risk site for malignant progression. Even mild dysplasia here warrants proactive management. Surgical removal or laser ablation can eradicate the dysplastic focus and permit thorough histological examination of margins. Observation is risky because the floor of the mouth is prone to malignant transformation, especially in a patient who smokes and consumes alcohol. Radiation therapy or antibiotics do not directly address premalignant lesions. Therefore, local excision of the lesion, along with habit cessation, is vital to reduce the risk of further malignant evolution.

120. (B) Incisional biopsy of the erosive area

When a patient exhibits chronic oral lesions—especially an erosive patch not healing with standard anti-inflammatory measures—biopsy becomes imperative to exclude dysplasia or carcinoma. Despite the presence of reticular lesions that might suggest lichen planus, the non-resolving,

erosive site in a high-risk habit user (areca nut) raises the possibility of malignant transformation. A blood panel or antifungal could explore alternative diagnoses, but they do not address the immediate concern of ruling out carcinoma. Steroid cessation alone does not confirm or exclude malignancy. Hence, histopathological assessment via biopsy is paramount.

121. (B) Neoplastic proliferation of stratified squamous epithelium with potential for local invasion and metastasis

Oral SCC arises from dysregulated, malignant transformation of the oral lining's stratified squamous epithelium. It has a high propensity for local tissue destruction, regional lymph node spread, and sometimes distant metastasis if not treated promptly. Salivary gland tumors typically arise from glandular elements, not squamous epithelium. A benign epithelial proliferation remains localized, lacking the capacity for destructive invasion or metastasis. Fibro-osseous lesions, like fibrous dysplasia, originate from bone and fibrous tissue, not surface epithelium. Thus, SCC refers to malignant squamous cells capable of invasive growth.

122. (B) HPV infection (particularly high-risk strains like HPV-16)

Aside from tobacco, alcohol, and betel quid chewing, high-risk HPV strains (especially HPV-16) are implicated in oropharyngeal and some oral squamous cell carcinomas. Persistent HPV infection can lead to oncogenic changes in epithelial cells. Chronic iron deficiency may predispose to Plummer-Vinson syndrome with esophageal webs, but alone it does not produce oral carcinoma. Fresh fruits and vegetables actually have a protective effect, and proton pump inhibitors are not recognized as oral carcinogens. HPV positivity is particularly associated with tumors in the oropharyngeal region but can also affect oral sites.

123. (B) Through chemical carcinogens that induce DNA mutations

Tobacco smoke contains numerous carcinogenic substances (e.g., polycyclic aromatic hydrocarbons, nitrosamines) that can bind to DNA, forming adducts that trigger mutations. Over time, these mutations accumulate, dysregulating key oncogenes and tumor suppressors such as p53. The combination of chemical exposure and local irritation fosters progression from hyperplasia and dysplasia to invasive malignancy. Thermal burns alone do not typically produce malignant transformation, nor does tobacco cause direct viral transformation or antibiotic resistance. Chemical carcinogenesis remains the principal mechanism by which smoking drives oral cancer development.

124. (D) Mid-dorsum of the tongue

Oral squamous cell carcinoma frequently occurs in high-risk mucosal areas: the lateral border of the tongue, ventral tongue, floor of the mouth, and oropharynx. These regions are typically thin, non-keratinized, and exposed to carcinogens. The mid-dorsal surface of the tongue is more heavily keratinized and less commonly a primary site for SCC. Although lesions can occasionally appear there, it is not recognized as a usual "high-risk" location. By contrast, the lateral and ventral surfaces, along with the floor of the mouth, are among the most frequent sites for primary oral SCC.

125. (B) Early SCC may present as a small ulcer or erythematous plaque; advanced SCC typically shows extensive invasion, possible bone involvement, and nodal metastases

Early oral SCC can appear as a subtle mucosal change—an ulcer, a speckled patch, or a slightly raised lesion—often mistaken for benign conditions. As the tumor progresses, it can invade deeper tissues, cause bone destruction, and spread to regional lymph nodes. Pain can manifest at any stage, though advanced lesions tend to be more symptomatic. Neither early nor advanced SCC is restricted by exophytic versus endophytic forms or by specific age groups. Thus, the major difference is the extent of local invasion and metastasis, which distinguishes early from advanced disease.

126. (A) Tumor thickness and nodal involvement

Prognosis in oral squamous cell carcinoma is most strongly linked to the extent of local invasion (tumor size, thickness) and cervical lymph node involvement. Thicker tumors have a higher risk of nodal metastasis and worse outcomes. Lymph node metastasis significantly reduces survival rates. Age alone is not the prime determinant of prognosis,

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and while prolonged lesion duration can delay diagnosis, staging metrics center on tumor size (T), node involvement (N), and metastasis (M). Superimposed candida infection does not dictate oncologic prognosis. Hence, T and N status remain key prognostic benchmarks.

127. (C) Incisional biopsy for histopathologic diagnosis

An ulcer on the lateral tongue persisting beyond 2–3 weeks, especially in an adult with risk factors, must be evaluated for possible malignancy. An incisional biopsy is critical to determine whether the lesion is dysplastic, carcinoma in situ, or invasive SCC. While antifungal or antiviral treatments may be appropriate if infection is suspected, a non-healing ulcer in a high-risk location mandates biopsy to rule out cancer. Nutritional supplementation does not address the suspicious nature of the lesion. Hence, the immediate and most appropriate step is diagnostic biopsy.

128. (A) Surgery plus adjuant radiation or chemoradiation

For stage III or advanced stage II oral SCC—where a lesion is around 3 cm and there is nodal involvement—combined treatment yields the best survival outcomes. Surgical resection (including partial glossectomy and ipsilateral neck dissection) typically addresses the primary tumor and regional lymphatics. Adjuvant radiotherapy or concurrent chemoradiation is often recommended to eradicate residual microscopic disease and decrease recurrence rates. Antibiotics, steroids, or local curettage do not effectively manage malignant tumors. While chemotherapy alone may be used palliatively or in certain protocols, combination therapy remains standard for resectable, node-positive oral SCC.

129. (C) Higher risk of local spread and regional recurrence

Perineural invasion occurs when tumor cells track along nerve sheaths. In oral squamous cell carcinoma, its presence signals a more aggressive phenotype, increasing the likelihood of persistent local disease, regional spread, and ultimately poorer clinical outcomes. Treatment may require more extensive surgical margins and consideration of adjuvant therapies to address these invasive pathways. Perineural invasion does not necessarily heighten radiation sensitivity, nor does it indicate a minimal recurrence risk. Topical therapies are insufficient for tumors with such an aggressive trait, underscoring the seriousness of perineural involvement.

130. (C) It frequently metastasizes early

Verrucous carcinoma, also known as Ackerman tumor, is indeed a well-differentiated variant of squamous cell carcinoma characterized by exophytic, verrucous (warty) proliferation. It typically demonstrates local infiltration but has a very low incidence of early metastasis, differentiating it from conventional SCC. While it can invade deeply, nodal or distant spread is rare without further malignant transformation. Hence, the statement claiming it "frequently metastasizes early" is incorrect. Local destructive potential is still a concern, requiring excision, but metastasis risk is notably lower than that of typical SCC.

131. (B) Heavy alcohol use and tobacco smoking

The combined effect of tobacco (smoking, chewing) and heavy alcohol consumption exponentially raises oral SCC risk beyond either factor alone. Alcohol may act as a solvent, facilitating carcinogen penetration from tobacco, and both substances contribute to genetic damage in oral epithelial cells. Bruxism, dietary preferences, or moderate sugar intake are not prime risk factors for oral cancer, though poor nutrition can also play a supporting role. The synergy between alcohol and tobacco remains among the most potent etiologic risk factors identified in oral carcinogenesis.

132. (A) Lip SCC (actinic cheilitis transforming into squamous cell carcinoma)

Prolonged sun (UV) exposure on the lower lip, especially in individuals with outdoor occupations or poor use of sun protection, often causes actinic cheilitis—an early precancerous alteration. Over time, dysplastic changes can progress to squamous cell carcinoma of the lip. Odontomas and fibromas are benign conditions of tooth-forming tissues or localized fibroblastic reactions. Erythema multiforme major is usually triggered by infections or drugs, not chronic UV exposure. Hence, the direct link between UV exposure and malignant transformation in lip epithelium is well documented.

133. (B) Referred pain via cranial nerve IX or X

Ear pain (otalgia) can be referred from oropharyngeal or tongue lesions via shared sensory innervation—often involving cranial nerves IX (glossopharyngeal) and X (vagus). These nerves supply both the pharynx/tongue base and parts of the external or middle ear, leading to perceived ear pain from an oral lesion. True metastasis into the ear canal or direct extension to the middle ear is rare for a tongue carcinoma. Sinus infections do not typically produce isolated ear pain. Referred otalgia is common in advanced or lateral tongue lesions due to overlapping nerve pathways.

134. (B) T2 N1 M0

T2 typically covers oral SCC lesions >2 cm but ≤4 cm in greatest dimension. A 2.5-cm lesion qualifies as T2. Palpable submandibular lymph node involvement corresponds to N1 if it's ipsilateral and clinically suspicious for metastatic spread. The absence of distant metastasis is designated M0. T1 is limited to lesions ≤2 cm, T3 lesions often exceed 4 cm or show deeper local invasion, and M1 means distant metastasis. Therefore, T2 N1 M0 accurately describes a moderately sized lesion with ipsilateral nodal involvement but no distant spread.

135. (B) Radiotherapy, with or without concurrent chemotherapy

Despite clear surgical margins, adverse features such as perineural invasion, multiple positive lymph nodes, or extracapsular spread signal a higher likelihood of recurrence. Adjuvant radiation, often combined with chemotherapy (e.g., cisplatin), is indicated to maximize local and regional control, eradicating microscopic disease. Antibiotics address infection risk but do not reduce recurrence, and topical steroids have no role in controlling malignant cells. When high-risk pathological findings emerge (e.g., perineural or vascular invasion, multiple nodal metastases), combined modality treatment significantly improves survival outcomes compared to surgery alone.

136. (B) A mycotic infection often caused by Candida albicans in immunocompromised or susceptible individuals

Oral candidiasis is a fungal (mycotic) infection primarily due to Candida species—most commonly C. albicans. While it can appear in healthy patients under certain conditions (poor oral hygiene, denture use), it is especially prevalent in immunocompromised hosts. Clinically, it may manifest as pseudomembranous ("thrush"), erythematous, or hyperplastic forms. Bacterial infections typically involve different organisms (e.g., periodontopathogens), whereas prion diseases and viral infections have entirely distinct etiologies. The presence of yeast and pseudohyphae upon microscopic examination confirms candidiasis.

137. (A) Oral hairy leukoplakia

Oral hairy leukoplakia is linked to EBV infection and is most commonly observed in immunosuppressed individuals (e.g., HIV/AIDS). It appears as vertical corrugated or "hairy" white plaques typically on the lateral borders of the tongue. The lesion does not scrape off easily (unlike pseudomembranous candidiasis) and can persist without significant pain. Herpetic stomatitis stems from HSV. Hairy tongue involves elongated filiform papillae but is not specifically EBV-related. CMV ulcers are deeper oropharyngeal lesions typically in severely immunocompromised patients, not presenting as corrugated plaques.

138. (A) Primary infection often involves widespread oral lesions; recurrent herpes typically appears on the lip vermillion (cold sore)

Primary herpetic gingivostomatitis (usually HSV-1) often presents in children as multiple oral vesicles/ulcers, gingival inflammation, and systemic signs like fever. Following resolution, HSV resides latently in the trigeminal ganglion. Reactivation results in recurrent herpes labialis (cold sores), usually limited to the lip border or perioral skin. Systemic involvement during recurrences is uncommon, and recurrences typically localize to mucocutaneous junctions. Thus, the broad involvement in primary infection and the usually localized lesion on the lip during reactivation distinguish these two manifestations of oral HSV infection.

139. (D) Pseudotumoral candidosis presenting as a large malignant mass

Oral candidiasis commonly appears as pseudomembranous (thrush)—wipable white plaques exposing a red surface beneath—

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erythematous (atrophic) areas, or a chronic hyperplastic form with a thickened white patch that may be less removable. While advanced candidiasis can sometimes form nodular lesions, it does not typically present as a large, malignant-like tumor mass ("pseudotumoral"). Such an expansive destructive lesion would be unusual for Candida, which more frequently produces superficial or mildly invasive infections. Therefore, a large malignant-appearing candidal mass is not recognized as a typical presentation.

140. (B) Actinomycosis typically produces draining sinus tracts with "sulfur granules"

Actinomycosis, often caused by Actinomyces israelii (a filamentous bacterium), is characterized by chronic infection forming sinus tracts that drain purulent material containing yellowish "sulfur granules." It frequently arises from mucosal disruption, such as oral trauma or periodontal pockets. Unlike many acute bacterial infections, actinomycosis follows an indolent course, can invade local tissues (including bone), and is not readily transmissible by casual contact. The presence of sulfur granules in exudate is pathognomonic. Actinomyces is a bacterium, not a virus, and it may involve soft tissue, bone, or both.

141. (C) Topical antifungal medication (e.g., nystatin or clotrimazole)

Pseudomembranous candidiasis ("thrush") is commonly seen in immunocompromised or steroid-using patients. The removable white plaques exposing an erythematous base indicate fungal overgrowth. First-line treatment typically involves topical antifungals like nystatin suspension or clotrimazole troches. In more severe or resistant cases, systemic fluconazole may be used. Antibiotics would worsen the fungal overgrowth, while antivirals (acyclovir) target herpes viruses, not fungi. Additional steroids would also exacerbate fungal infection. Thus, topical antifungal therapy is the correct choice for mild to moderate oral thrush in this scenario.

142. (D) Coxsackieviruses (Picornaviridae family)

Herpangina and hand-foot-and-mouth disease are typically caused by Coxsackie A viruses (a genus under the Picornaviridae family). They produce oral lesions, often with fever and sometimes lesions on hands and feet (in HFMD). Herpesviruses are behind herpes simplex infections, Varicella-Zoster, and EBV. Orthomyxoviruses (e.g., influenza) and paramyxoviruses (e.g., measles) have different clinical syndromes. Coxsackievirus infections in children commonly present with small vesicles that rapidly ulcerate, often accompanied by mild systemic symptoms. Hence, coxsackievirus is the prime suspect for these characteristic oral vesiculoulcerative childhood syndromes.

143. (C) Antiviral therapy (e.g., high-dose acyclovir or valacyclovir)

Oral hairy leukoplakia, commonly due to EBV in immunocompromised patients (particularly HIV), is usually asymptomatic. If it causes discomfort or cosmetic issues, antiviral therapy can reduce lesion severity. Improving the patient's immunological status with antiretroviral therapy also helps. Topical steroids are less effective because the lesion is virally mediated, and antibiotic rinses do not address EBV. Laser ablation may temporarily remove the plaque but is not always necessary. Hence, antivirals like acyclovir, valacyclovir, or famciclovir are used if intervention is warranted beyond ensuring optimal HIV management.

144. (A) Fungal hyphae and pseudohyphae invading the superficial keratin layer

Under the microscope, pseudomembranous candidiasis reveals collections of fungal organisms—both hyphae and pseudohyphae—on or within the superficial mucosal layers. Periodic Acid-Schiff (PAS) or Gomori methenamine silver (GMS) stains highlight these branching filaments. Viral infections typically show intranuclear inclusions (like herpes) or cytoplasmic changes. Granulomatous reactions with giant cells are more typical of chronic bacterial (e.g., tuberculosis) or deep fungal infections. Spirochete infiltration suggests syphilis or other spirochetal diseases, not candidiasis. Thus, the presence of branching fungal elements near the surface confirms Candida overgrowth.

145. (D) Oral syphilis is fully prevented by prophylactic antibiotic mouthwashes

Syphilis, caused by Treponema pallidum, can manifest with oral lesions in various stages. The classic chancre of primary syphilis is typically painless and may appear on the lips, tongue, or gingiva. Secondary syphilis can involve mucous patches, which are highly infectious, and tertiary syphilis occasionally produces destructive gummas in the oral cavity. However, prophylactic antibiotic mouthwashes do not guarantee prevention of syphilitic infection, which is typically transmitted sexually or through direct contact with infectious lesions. Full prevention requires safe sexual practices and appropriate systemic antibiotic treatment if exposed.

146. (C) Herpes simplex virus reactivation (HSV) in immunocompromised hosts

In immunocompromised patients (e.g., HIV, transplant recipients), recurrent herpes simplex can cause extensive or persistent oral ulcerations. Lesions may involve both keratinized and non-keratinized mucosa, whereas in immunocompetent individuals, recurrent HSV typically localizes to the lips (cold sores) or attached gingiva/hard palate. Traumatic ulcers do not usually become multiple or chronic. Aphthous stomatitis (canker sores) occurs on non-keratinized mucosa and is not typically driven by immunosuppression to become extensive. Condyloma acuminatum is a papillomatous lesion caused by HPV, not a painful ulcerative process.

147. (B) Denture stomatitis (chronic atrophic candidiasis)

Improper denture hygiene promotes fungal colonization—especially Candida species—on the fitting surface of dentures. This environment fosters chronic atrophic changes in the underlying mucosa, known as denture stomatitis. The condition manifests as an erythematous area on the palate or alveolar ridge beneath the denture. Xerostomia can contribute but is not directly caused by plaque-laden dentures. Traumatic fibroma arises from mechanical irritation, whereas herpetic whitlow affects the fingers (usually from HSV infection). Thus, the direct result of poor denture cleanliness and fungal overgrowth is denture stomatitis.

148. (C) Supportive care and hydration, possibly antiviral therapy

Primary herpetic gingivostomatitis, especially in children, generally requires supportive care to manage fever, pain, and dehydration risk. Adequate fluid intake, analgesics, and mouth rinses to maintain comfort are key. Antiviral therapy (like acyclovir) can be considered in severe presentations or immunocompromised patients. Antibiotics target bacterial infections, not HSV, and surgical debridement is unwarranted for viral lesions. While topical steroids may occasionally reduce inflammation, they are not standard for acute primary HSV infection. Thus, supportive and symptomatic management remains the cornerstone.

149. (B) Immunosuppression due to HIV

Histoplasma capsulatum is a fungus endemic in certain geographic regions (e.g., river valleys in the Americas). In immunocompetent individuals, infection is often asymptomatic or mild. However, immunosuppressed patients (like those with poorly controlled HIV) are at greater risk for disseminated disease, which can involve the oral cavity. This patient's chronic, non-healing ulcer strongly suggests immunocompromised status, enabling fungal proliferation. Dietary habits or candida coinfection are less pivotal in predisposing to histoplasmosis, and unpasteurized milk commonly relates to bacterial infections like brucellosis, not histoplasma. Hence, HIV-induced immunosuppression is the major risk factor.

150. (A) Surgical debridement and high-dose amphotericin B

Mucormycosis is an aggressive fungal infection caused by fungi in the Mucorales order, frequently seen in diabetic or severely immunocompromised patients. It can invade blood vessels, leading to tissue necrosis, especially in the maxillofacial region (rhino-orbital-cerebral mucormycosis). Prompt and aggressive surgical debridement of necrotic tissue plus systemic antifungal therapy (typically IV amphotericin B) is critical to survival. Antibiotics, antivirals, or topical antiseptics do not address this rapidly progressing fungal infection. Delaying or minimizing intervention severely compromises outcomes, underscoring the necessity of radical debridement and potent antifungal drugs.

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151. (C) Applies dental knowledge to legal and criminal issues

Forensic odontology involves using dental science to assist in legal proceedings. This field covers a broad spectrum, including the identification of unknown remains based on dental records, analyzing bite marks in criminal cases, and estimating age or ancestry of victims or suspects. Forensic dentists may also interpret patterned injuries on skin or other materials to link them to a particular dentition. By comparing antemortem and postmortem dental records, forensic odontologists can establish a deceased individual's identity with high reliability. Hence, the core definition involves applying dental expertise to address questions of law and justice.

152. (B) Assessing pulp chamber size via radiographs of the teeth

Age estimation in forensic dentistry often relies on changes in teeth as individuals grow and mature. One recognized approach examines pulp chamber size on radiographs, leveraging the fact that secondary dentin deposition reduces pulp volume over time. Other established methods include evaluating tooth eruption stages in children or analyzing cementum annulations. Alveolar crest height varies with periodontal health rather than strictly age, and the frontal sinus or TMJ are not central to dental-based age determination. Thus, pulp chamber reduction on dental radiographs is a frequently employed forensic indicator of age progression.

153. (C) They are highly resistant to decomposition, fire, and environmental extremes

Teeth are among the most durable structures in the human body, largely because of their high mineral content (enamel is around 96% mineral) and robust anatomical configuration. Even under harsh conditions—such as high temperatures, soil acidity, or prolonged immersion—dental tissues and restorations frequently remain intact, enabling postmortem forensic analyses. This resilience contrasts with many other tissues that can quickly degrade. Moreover, each dentition can display unique restorations, wear patterns, or orthodontic treatments, strengthening the evidentiary value of dental remains for identification. Consequently, teeth consistently serve as a primary means of confirming identity in forensic contexts.

154. (D) Exact DNA profile of the suspect from an intraoral photograph

Dental records typically include information about restorations (fillings, crowns, implants), any extractions or missing teeth, tooth alignment, and specific occlusal relationships. Such records, including radiographs and clinical notes, provide a unique "dental fingerprint." However, an intraoral photograph cannot supply an individual's DNA profile. DNA analysis requires biological samples, such as pulp tissue, saliva, or a known sample of the person's genetic material. Photographs offer visual documentation of dental traits, but they lack the genetic evidence needed for a DNA profile. Hence, that option does not support direct genetic identification.

155. (C) Bite mark analysis can be complicated by skin elasticity and distortion, whereas fingerprints are more stable

Fingerprint patterns remain relatively constant and are generally unaffected by short-term environmental factors, allowing consistent replication of ridge details. By contrast, bite marks on skin are prone to distortion from elasticity, swelling, or positional changes. This variability complicates the exact matching of a suspect's dentition to the wound. Additionally, skin can heal or degrade, altering the mark's clarity over time. While both methods aim to compare unique patterns, fingerprints enjoy greater reliability and reproducibility. Bite mark evidence can still be useful but must be interpreted carefully alongside other corroborating forensic data.

156. (B) Clear, well-defined arches and tooth imprints with consistent spacing

Forensic comparison of bite marks relies on visualizing enough characteristic points—such as arch form, tooth alignment, and individual tooth shape or rotation—that match the suspect's dentition. A clear bite mark displaying distinct incisal edges, cusp positions, and inter-tooth spacing greatly strengthens the forensic linkage. Faint or overlapping marks are more prone to misinterpretation, and highly mobile or distorted areas can cause the pattern to change. Thus, a crisp, well-defined imprint is crucial to reliably differentiate one person's bite from another. This

clarity bolsters the probative value of bite mark evidence in legal proceedings.

157. (C) Using the same individual's known AM dental radiographs to evaluate PM remains

A cornerstone of forensic odontology is verifying identity by comparing known antemortem dental records (radiographs, charts, documented restorations) with findings from the deceased's remains. If these data align—e.g., same filling positions, root canal shapes, or unique crown margins—investigators can confidently establish a match. Simply matching alveolar bone shapes or random facial images would not ensure a reliable correlation. Occupation inferences from staining or wear might be speculative. The real power lies in side-by-side comparison of a presumed decedent's antemortem X-rays and the postmortem radiographs, revealing identical dental landmarks and restorations.

158. (C) Retrieve and label each tooth fragment carefully for radiographic comparison

Even in severe fires, teeth can remain sufficiently intact or partially calcined but still provide valuable clues. The forensic dentist's priority involves methodical recovery of dental structures, labeling tooth positions, and preserving them for radiographs. Subsequent comparison with known antemortem records can yield a positive identification if matching features are found. While DNA from alveolar bone or pulp might also be pursued, properly documenting and radiographing tooth fragments is essential for immediate forensic evaluation. Merely discarding them or relying on eyewitness accounts fails to leverage the robust evidentiary potential of the teeth.

159. (C) A diastema between upper central incisors clearly visible in the mark

A diastema, or space, between upper incisors is a distinct morphological trait that can manifest as a gap in a bite mark pattern. If the bite mark displays a gap mirroring that diastema, it strengthens the connection to a particular suspect's dentition. Subtle features like rotated teeth, missing cusps, or irregular incisal edges may also be identifiable. Conversely, general semicircular or shallow impressions lack specificity. Fused or overlapping tooth marks can obscure clarity. When a distinctive spacing or tooth arrangement matches the suspect's known pattern, it greatly heightens the bite mark's evidentiary significance.

160. (C) Dental development stages are unaffected by severe nutritional deficiencies

Many forensic dental age estimation techniques rely on predictable tooth eruption patterns and morphological changes. For instance, children's ages can be gauged by which primary and permanent teeth have emerged, while adults' ages can be approximated via pulp/tooth ratio changes or cementum layers. However, severe malnutrition or systemic diseases can alter the timing and pace of dental development and eruption. Thus, the statement that dental development is entirely unaffected by nutritional deficiencies is incorrect. Biological and environmental factors can influence tooth formation, occasionally complicating exact age estimates in affected individuals.

161. (A) Availability of high-quality antemortem dental records for comparison

Positive identification hinges on correlating postmortem dental findings with comprehensive, accurate antemortem records. Detailed dental charts, radiographs, and documented procedures improve the chance of matching restorations, root structures, or anomalies. While severe wear or unique features can aid identification, they must be cross-referenced with existing data from the deceased's life. If no prior dental records exist, establishing a match is challenging despite unique findings. The cause of death does not directly impact the likelihood of dental identification; the key factor is whether there is quality antemortem data available to compare.

162. (B) It often leads to multiple extractions or tooth loss, reducing available comparative points

In forensic odontology, the more unique points of comparison—such as fillings, tooth morphology, or root canal shapes—the easier it is to make a confident identification. Advanced periodontal disease can cause extensive tooth mobility and eventual tooth loss, diminishing the number of surviving dental structures. Fewer teeth and fewer restorations mean fewer distinguishing features to align with old records. While periodontal disease

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may not literally "eliminate all tooth anatomy," losing multiple teeth or altering the alveolar ridge certainly hampers the accuracy of identification, as fewer key points remain for reliable matching.

163. (B) Provides a direct link to antemortem dental records

Certain dental prostheses, such as partial or full dentures, can be inscribed or labeled with the patient's name or unique identifier for identification purposes. If the discovered denture contains such labeling, forensic teams can directly correlate it with the patient's documented records or contact the issuing dental clinic. This method is especially helpful if other bodily features are unrecognizable. Although the denture does not determine cause of death or nationality, it can serve as an immediate reference to cross-check with antemortem information, simplifying and speeding up the process of positively identifying the remains.

164. (B) Positive identification based on matching dental restorations and root canal forms

Forensic odontology hinges on matching unique dental traits observed postmortem with an individual's documented antemortem records. In this scenario, the presence of gold foil restorations, a porcelain crown on tooth #7, and a distinct root canal configuration on #11 precisely align with the dentist's notes and radiographs. Such correspondences of multiple uncommon features strongly confirm identity, typically obviating the need for additional tests. While DNA analysis can be a supplemental tool, the confluence of highly specific points of agreement in dental records typically suffices to establish a positive identification with a high degree of certainty.

165. (A) Visualizing and comparing radiographic landmarks

When unidentified skeletal remains appear, forensic odontologists first examine the teeth and jaws, then compare them to the missing individual's antemortem dental X-rays. This often involves noting distinctive root shapes, canal morphologies, restorations, or any pathologies. Radiographic superimposition can reveal whether the angle and configuration of anatomical landmarks in the postmortem images match those in antemortem films. While photography, metal analysis, or facial reconstruction might eventually contribute, the initial and most pivotal step is systematically aligning key points—like crown outlines or root canals—between the remains' X-rays and the known individual's archived radiographs.

166. (B) Conduct local searches for possible antemortem dental providers

In a situation where a decedent's distinctive bridges and onlays match what family members recall but no direct antemortem records exist, the forensic dentist should attempt to locate any possible treatment source. Often, patients might have visited multiple clinics or a specialist whose records remain on file. By contacting local practices or reconstructing the patient's likely dental history, the dentist can potentially obtain past radiographs or treatment notes describing the same missing teeth, bridge design, or gold onlay. This can provide the vital data required for a positive identification, preventing classification as unidentified remains.

167. (B) DVI (Disaster Victim Identification) Interpol protocol

Mass disasters—such as plane crashes, natural calamities, or terrorist attacks—often leave multiple victims requiring identification. Interpol's Disaster Victim Identification (DVI) protocol is internationally recognized, guiding the systematic collection, comparison, and reconciliation of ante- and postmortem data. It outlines the roles of different forensic experts, recommended documentation procedures, and standardized forms for recording dental and other identifying details. The FDI's numbering system pertains to tooth notation, not mass disaster protocols. Periodontology guidelines or the NIH's research standards are unrelated to large-scale victim identification. Therefore, the DVI Interpol protocol is the benchmark in such mass casualty events.

168. (C) A small notch or irregular break in the incisal perimeter of the mark

When a suspect's tooth has a chipped or fractured incisal edge, it may transfer that distinctive shape onto the bitten surface. Instead of a smooth, continuous outline, the resulting bite mark might display a localized notch or irregular indentation.

This discontinuity can be especially apparent if the chipped tooth is in the maxillary or mandibular incisors, which often engage the skin first. Uniform rectangular or parallel patterns do not suggest chipped enamel. Hence, the presence of a small, irregular break in the mark's outline is a key clue of a chipped incisor.

169. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Forensic odontologists may obtain DNA from tooth pulp in skeletal remains or from saliva deposited during a bite. The pulp is well-protected by enamel and dentin, helping genetic material remain intact despite harsh environments. Meanwhile, saliva left on skin or bite mark evidence can yield epithelial cells suitable for DNA profiling, provided the sample is collected promptly and not exposed to degrading factors like extreme heat or bacterial overgrowth. Hence, the reason—teeth and saliva can preserve genetic markers—directly explains why DNA retrieval from the pulp or saliva is feasible in forensic contexts.

170. (A) Observing cusp tip patterns

To confirm a bruise as a bite mark, forensic experts look for arch-shaped patterns, individual tooth impressions, or cusp tip outlines consistent with upper and lower dentition. Photographs with a scale, and possibly an impression of the injury, may help. Analyzing these anatomical details can differentiate a simple bruise from a patterned injury. Checking viral loads, gingival status, or alveolar heights are not relevant here. Matching cusp configurations and incisal edges with a suspect's dentition is the key forensic approach to identifying or excluding a bite mark in assault investigations.

171. (C) Serve as a potentially strong corroborative feature linking suspect to the bite

Forensic bite mark comparison relies on identifying unique dental characteristics. In this scenario, the suspect exhibits an atypically wide canine spacing—a detail that may transfer to the victim's skin as a similarly wide gap in the bite arch. If the mark displays that same inter-canine distance, it becomes a distinctive point of correspondence. Although bite mark evidence alone rarely forms an entire case, it can significantly strengthen or corroborate other investigative findings. Courts may weigh it with caution, yet when properly documented and confirmed by experts, such a match can be compelling circumstantial evidence implicating the suspect.

172. (C) Study of palatal rugae patterns

Rugoscopy focuses on the palatal rugae—ridge-like folds in the anterior portion of the hard palate. These rugae demonstrate individualistic patterns, much like fingerprints, and can serve as a supplementary means of identification when teeth are missing or destroyed. Investigators record or cast the rugae, comparing them with any known antemortem palate records or patterns. Lip print analysis is cheiloscopy; alveolar bone measurements track periodontal status, and incisal wear facets might indicate diet or habits but are less reliable for personal identification. Rugoscopy underscores how subtle anatomic features can hold forensic significance in certain cases.

173. (C) Federation Dentaire Internationale (FDI) two-digit system

The FDI World Dental Federation notation is widely adopted internationally for forensic and clinical contexts, assigning each quadrant a number (1–4 for permanent dentition, 5–8 for primary) and each tooth within that quadrant another number (1–8 for permanent, 1–5 for primary). This results in a two-digit code for each tooth (e.g., upper right central incisor is "11"). Zsigmondy-Palmer and the Palmer bracket system are older or regionally used approaches, while the Universal system (1–32) is standard in the United States. Globally, FDI's system is the most commonly endorsed for uniform forensic documentation.

174. (C) Lips are highly mobile and subject to smudging or distortion

Cheiloscopy examines the unique patterns of lines and fissures on the lips, potentially linking a suspect to a surface or object. However, capturing stable, undistorted prints is challenging because the lips readily move, and any impression can smudge, fade, or shift during contact. This variability can complicate matching a questioned print to a known individual with high certainty. Although lip prints might contain characteristic patterns, their reliability

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can be compromised by environmental factors or partial impressions. Consequently, cheiloscopy typically serves as supportive rather than stand-alone evidence in forensic investigations.

175. (B) Handedness of the deceased

Dental records can reveal a wealth of personal information: evidence of prior orthodontic interventions (braces or retention wires), cultural modifications (tooth filing, decorative inlays), and structural anomalies (missing or extra teeth). However, a person's dominant hand is not directly discernible from studying teeth alone. Handedness typically correlates with motor preferences and might be inferred from wear patterns on certain tools, but the dentition itself does not reflect which hand the individual favored. Thus, identifying left- or right-handedness purely via dental examination is not a recognized outcome of forensic odontology.

176. (C) They allow visual detection of restorations in remains when radiographs are unavailable or inconclusive

Certain materials or dyes can be incorporated into restorative materials, enabling them to fluoresce under specific light wavelengths. This feature can be particularly useful when postmortem radiographs are challenging to interpret, or when remains are so compromised that standard X-rays yield limited information. By shining an appropriate light source, the restorations become visibly fluorescent, helping the examiner locate them quickly. This does not automatically diagnose caries or clarify cause of death, nor does it produce universal radiopacity. Instead, it offers a supplemental visual method for detecting dental work in forensic contexts.

177. (B) Photograph the bite mark with a ruler scale and take a saliva swab

Accurate documentation of bite mark evidence is critical. Clear photographs with an appropriate scale (e.g., ABFO scale) help record the mark's dimensions, shape, and relation to anatomical landmarks. This visual record can be analyzed later for pattern matching. Additionally, swabbing the area for saliva can yield DNA evidence linking the suspect to the bite. Delaying examination or ignoring photographic documentation risks loss of clarity as bruising changes color or the area heals. Reproducing the mark on the suspect's arm is neither practical nor probative. Hence, proper photography and biological sampling is the optimal forensic approach.

178. (B) Attempt to analyze the tooth's morphology for human vs. animal origin, then use DNA if feasible

When isolated dental structures are discovered, the first task is to confirm whether they belong to a human. Forensic experts compare morphological cues (enamel thickness, cusp patterns) or consult reference data to distinguish human teeth from animal. If deemed human, further steps may involve DNA extraction from pulp if present, possibly matching it to a known missing person's profile. Concluding that it belongs to the missing individual without thorough analysis would be premature. A full autopsy is impossible given only a tooth. Thus, morphological examination followed by molecular testing (if possible) is the logical approach.

179. (B) Stabilize and label the fragment and proceed with forensic dental imaging

When a jaw fragment is recovered in a mass disaster or fire, the priority is to secure and protect the specimen to avoid additional damage or loss of key features. Proper labeling with a unique identifier ensures a reliable chain of custody. Next, thorough radiographic imaging (often multiple angles) is done to document remaining tooth roots, restorations, or alveolar bone details. Forceful manipulation or immersion in harsh chemicals risks destroying fragile evidence. While advanced reconstructions may follow later, the immediate step is careful stabilization and radiographic examination to preserve and interpret the critical dental evidence.

180. (C) Decorative inlays or intentional filing of anterior teeth

Certain cultures practice tooth filing, shaping, or embedding decorative materials (like gems or metals) in anterior teeth. Such modifications reflect traditional beliefs, status symbols, or aesthetic customs. If found during forensic examination, these features can suggest an individual's cultural background or region of origin. While caries prevalence or total tooth count can vary by population, those factors alone do not necessarily signify cultural influence. Decorative inlays or

deliberate alterations are more explicit markers of cultural identity and can provide meaningful leads to narrow down the decedent's heritage or life history.

181. (C) Restorative materials themselves are a direct source of nuclear DNA

Forensic odontology often employs DNA analysis on pulp tissue within teeth or residual saliva from a bite mark to link remains or an offender to a crime. These biological materials can harbor nuclear DNA suitable for profiling. Restorative materials, however—like amalgam, composite resins, or glass ionomer—do not contain nuclear DNA. They are non-biological and do not carry the person's genetic code. Investigators can sometimes glean partial mitochondrial DNA from extremely preserved areas, but the notion that fillings or crowns directly supply nuclear DNA is incorrect. Hence, statement (C) is the erroneous one.

182. (B) Multiple unique dental restorations or anomalies for each skeleton

Positive identification often hinges on matching distinctive dental traits from ante- and postmortem data. Features like root canal treatments, unusual cusp forms, or multiple restorations enhance the chance of finding unique points of concordance. If the skeleton has no restorations or anomalies, the dentition is less individualized, reducing identification certainty. Relying solely on a specific numbering system (universal vs. FDI) does not inherently raise matching success. Similarly, if all skeletons are of similar ages, it does not inherently clarify which set of remains corresponds to which missing individual without distinctive dental identifiers.

183. (C) They exhibit characteristic radiopaque filling shapes that can match antemortem radiographs

When a tooth undergoes root canal therapy, the endodontic filling material (e.g., gutta-percha) shows a distinct radiopacity in the canal on X-rays. Variations in technique, the shape or length of the filling, and any accessory materials become identifiable markers. By superimposing postmortem and antemortem radiographs, forensic odontologists can confirm if both images depict the same unique endodontic patterns. This advantage arises from the precision of endodontic procedures, not from guaranteed alveolar defects or DNA in the filling. While pulp size diminishes with age, the major effect is the consistent, radiographically visible root filling.

184. (C) Match restorations, root contours, and anatomical landmarks

Bitewing radiographs, though intended primarily for caries detection and evaluating crestal bone levels, still capture distinctive tooth shapes, restorations, and root structures. Even after three years, many features—such as the presence and outline of fillings, pulp chamber size, or the contour of the alveolar crest—can remain largely unchanged. Forensic dentists can carefully compare these points to the postmortem dentition. 3D scanning is an option, but the essential process is correlating unique landmarks. Provided the victim's remains still include recognizable teeth or alveolar bone, the older bitewings can be pivotal in establishing a positive identification.

185. (A) The pattern clearly indicates inter-canine distance and distinct incisal shapes, matching a human dentition

Bite marks often show semicircular or oval arcs reflecting upper and lower dental arches, with individual incisal edges creating discrete patterns. The measured distance between canines, shape of incisors, and any cusp impressions can differentiate a true human bite from scratch marks left by fingernails. Fingernails produce narrow, linear or curved scratches, rather than the cusp-based contoured imprint of teeth. When analysis yields consistent tooth spacing and morphological alignment with a suspect's dentition, it substantiates the victim's claim. Although contusions sometimes overlap, a precise pattern matching standard dental parameters strongly supports that these injuries are human bite marks.

186. (C) Cone-beam computed tomography (CBCT)

In cases where standard radiographs fail to yield detailed imagery—due to overlapping structures or burn damage—cone-beam computed tomography (CBCT) can offer high-resolution, three-dimensional views of the teeth and jaw. CBCT is particularly effective for identifying the shape and

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extent of any root canal fillings or residual fragments in heavily compromised remains. MRI is less suited for capturing fine bony or dense materials like gutta-percha, while ultrasonography and infrared thermography have limited applicability for examining internal tooth structures. Consequently, CBCT stands out as the specialized imaging modality for forensic dental evaluation under these conditions.

187. (B) Fractured alveolar bone corresponding to a documented jaw injury

When antemortem trauma, such as a documented jaw fracture, leaves characteristic healing patterns in alveolar bone or specific hardware (e.g., fixation plates), it can serve as a strong link between the decedent's remains and their prior medical history. Tooth wear or calculus presence is too nonspecific to confirm identity. The transition from primary to permanent teeth is predictable by age, offering less uniqueness. A previously healed alveolar fracture with surgical evidence or callus formation that exactly matches patient records, however, is a strong sign connecting the skeleton to the known individual's medical background.

188. (C) They remain impervious to data corruption or accidental deletion

Electronic or digital archiving of dental data improves efficiency in retrieving records and forwarding them to investigative teams. Dentists can include comprehensive notes about restorations, periodontal conditions, or injuries. High-resolution digital images, such as radiographs or clinical photographs, can be attached for forensic comparison if needed. However, no digital system is entirely immune to data corruption, hardware failures, or accidental deletions, which is why secure backups and stringent data management protocols are critical. The statement suggesting digital records are entirely impervious to corruption is incorrect, as technology-based storage always carries some vulnerability.

189. (B) Immediate swabbing of the bite area for saliva

DNA recovery from bite marks depends on the timely collection of residual saliva. The sooner investigators swab the area, the more likely they'll capture intact epithelial cells or saliva containing the perpetrator's DNA. Factors like washing, contamination, or delayed sampling reduce the available genetic material. Smoking, while affecting oral flora, does not specifically aid or hinder DNA yield in a straightforward manner. Highly mobile tissues can distort the bite pattern, and thorough cleaning by the victim can remove or degrade saliva. Hence, prompt swabbing for saliva is crucial to maximize the chances of obtaining viable DNA.

190. (C) It reduces or eliminates unique dental features that could match prior records

When several teeth are extracted antemortem, the patient loses potential identifiers like restorations, root shapes, or morphological anomalies. If no prosthetic replacements or implants are placed with documented serial numbers, it becomes more difficult for forensic experts to link postmortem findings to old X-rays featuring those now-absent teeth. While alveolar bone typically persists, the key distinct markers from the actual teeth vanish, complicating subsequent identification efforts. Not all extractions lead to implants, and an edentulous mouth can appear relatively uniform, thereby reducing the number of distinctive points for forensic comparison.

191. (B) Spiral cracks reproducing in the bite impression

Dental injuries—like spiral fractures in the incisal edges—often leave characteristic shapes or jagged borders when someone bites skin. If the suspect's fractured incisors align exactly with the distinctive notches or cracks observed in the bite mark, that correlation strongly suggests he inflicted the bite. General arch shape alone may be shared by many individuals, and RBC counts or nonspecific lacerations do not reliably link a suspect's unique oral features to a wound. Hence, reproducing the same spiral pattern within the bite mark is the decisive detail connecting the suspect's dentition to the injury.

192. (B) Taking panoramic radiographs of all jaws and comparing them with any available local records

Faced with multiple decomposed victims and incomplete documentation, the forensic dentist's most effective approach is to systematically radiograph each recovered jaw. Panoramic radiographs capture a broad overview of the teeth,

alveolar bone, and any prostheses or anomalies. Those images can then be matched against any partial local dental records that exist, revealing coinciding crowns, unique wear patterns, or extractions. Cremation would destroy critical evidence, and witness testimonies alone are often unreliable. Fingernail clippings might help with DNA for some cases but not specifically with dental-based identifications. Hence, panoramic radiographs plus targeted record comparisons remain paramount.

193. (C) Label the evidence as inconclusive or partial match, seeking additional corroboration

Bite mark comparisons demand high caution, given the potential for distortion and subjectivity. If the suspect's dental cast shows partial but not definitive alignment, experts typically cannot declare a perfect match. They either classify the result as "inconclusive" or "possible match" but advise caution in using that evidence alone. Additional corroborative data—DNA swabs, witness statements, or other forensic findings—may be needed. The forensic odonatologist's role is to assess pattern similarities, not to force a match. Thus, partial alignment seldom yields a conclusive identification unless it aligns with a robust evidentiary context.

194. (B) Clearly labeling, sealing, and documenting each item's transfer among personnel

Maintaining a meticulous chain of custody is critical in forensic investigations to preserve the integrity and admissibility of evidence. Each piece of dental evidence—be it a tooth, impression, or radiograph—must be carefully labeled with a unique identifier, sealed in tamper-evident packaging, and accompanied by documentation recording every exchange of possession. Anyone who handles or transports the evidence must sign for it, ensuring accountability. Handing evidence to bystanders or leaving it unsealed invites contamination or loss. Proper chain of custody protocols protect against challenges in court that the evidence was compromised or mishandled.

195. (C) It is universally accepted as indisputable proof of guilt

Bite mark evidence, while valuable, is not considered a failproof identification method in forensic science. Human skin's elasticity and healing response can alter or distort the details. This means a perfect match between the suspect's dentition and the victim's wound is not commonly achieved, and experts frequently qualify their conclusions. Courts now recognize that bite mark comparisons require corroboration, such as DNA analysis from residual saliva, to bolster reliability. Consequently, statement (C)—claiming universal acceptance of bite mark evidence as indisputable—is incorrect. It's an important but sometimes controversial piece of evidence subject to strict scrutiny.

196. (B) The distinct pattern of mixed dentition with partially erupted permanent teeth can match exactly to radiographs

A child transitioning from primary to permanent teeth undergoes a unique, sequential eruption pattern, with some adult teeth partially emerged while others remain absent. Antemortem radiographs can capture precisely which teeth are in place, partially erupted, or yet to develop. This combination of tooth eruption timing and tooth crypt formation is highly individual for a given age, potentially enabling a near-exact match to the child's postmortem findings. Deciduous teeth do eventually exfoliate, so they are not permanent identifiers, but the in-progress state of tooth eruption fosters a fairly distinctive "timeline" that can be compared forensically.

197. (B) Quicker access to antemortem records during investigations

Close collaboration between forensic specialists and local dental networks ensures that, when an unidentified body or suspect's records need confirmation, the relevant antemortem data can be found and shared efficiently. Rather than combing through numerous offices blindly, forensic odonatologists with established contacts can swiftly identify the treating dentist or specialist. This reduces delays in obtaining radiographs, charts, or treatment notes crucial for identification. While laws protecting patient confidentiality remain in effect, authorized legal contexts (e.g., official death investigations) permit sharing under established guidelines. Hence, direct relationships speed up retrieving vital antemortem dental records.

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198. (B) Demonstrating characteristic arch width and tooth size patterns consistent with typical female metrics

Though there is wide variability, females often have smaller arch widths and tooth dimensions on average compared to males. Forensic dentists can measure the bite mark's arch circumference, tooth spacing, and cusp impressions. If they align strongly with the typical female range (and deviate notably from male averages), it supports the hypothesis that a female inflicted the bite. However, using hormone levels or blood group is not standard for deducing the perpetrator's sex via bite evidence. Foot size correlation is unrelated. Thus, comparing arch dimensions or tooth size metrics is the more accepted forensic approach.

199. (A) Minimizing duplication of evidence, ensuring each part is tracked

In large-scale disasters, fragmentation of remains can occur, potentially scattering jaw segments away from the main skeleton. A systematic approach requires each recovered fragment—mandible, maxilla, or partial jaws—to be labeled with a unique identifier and stored separately. This practice reduces confusion and prevents mixing different individuals' remains. The forensic team later examines each piece, cross-referencing it with missing-person data or antemortem records. Proper labeling and documentation avoid duplication of evidence or misallocation to the wrong body bag. Retaining only certain fragments or discarding "small" pieces could hamper accurate identification. Hence, each labeled piece preserves crucial forensic detail.

200. (C) Matching antemortem radiographs or dental notes describing the same unique shape and crowns

To finalize a dental identification, forensic experts must compare the skeleton's dental details—like its "U"-shaped palate arch and gold crowns—with specific antemortem records. Radiographs, clinical charts, or documented notations that detail the same arch configuration, crown placements, or occlusal schemes provide strong, evidence-based confirmation. Observing alveolar thickness alone or re-checking cause of death does not yield direct identity verification. Additional autopsies may clarify medical issues but are less relevant for confirming dental matches. Ultimately, confirming consistent morphological and restorative features between postmortem findings and existing antemortem data closes the loop on a definitive identification.

CHAPTER 03

ORAL & MAXILLOFACIAL SURGERY

1. (B) Eliminating or reducing pathogenic microorganisms

   Surgical asepsis centers on preventing microbial contamination in the operative field. This includes proper hand hygiene, sterilization of instruments, and strict maintenance of sterile zones. By controlling pathogens, surgeons reduce infection rates and help promote optimal healing outcomes. While sedation and hemostasis techniques are also important, they do not directly address the primary goal of asepsis, which is to diminish or eradicate harmful microorganisms. Hence, maintaining aseptic conditions through thorough sterilization and infection-control measures remains the cornerstone of ensuring patient safety in oral surgery.

2. (D) Prothrombin time (PT) and INR

   Prothrombin time and INR (International Normalized Ratio) are key in detecting coagulation abnormalities that might lead to excessive bleeding during or after surgery. A prolonged PT/INR may point to issues such as vitamin K deficiency, liver pathology, or use of anticoagulant medication, all of which can complicate oral surgical procedures. Although a complete blood count is beneficial for assessing platelet levels and overall hemoglobin status, PT/INR specifically evaluates the extrinsic pathway of coagulation. Early detection of coagulopathy allows the surgical team to modify treatment and reduce intra- or postoperative bleeding risks.

3. (C) A method to categorize patients by physical status and systemic health

   The American Society of Anesthesiologists (ASA) Classification is widely used to evaluate a patient's overall health and anesthetic risk. Patients are grouped based on systemic conditions, ranging from ASA I (healthy) to ASA VI (brain-dead organ donor). This classification ensures the surgical team tailors procedures and anesthesia management to each individual's health status, identifying higher-risk individuals who may need additional care. While antibiotic sensitivity charts and dental charting systems exist, these do not classify systemic health. Thus, understanding a patient's ASA status is crucial for risk mitigation and optimizing surgical outcomes in oral surgery.

4. (D) Routine echocardiogram for all patients

   Preoperative evaluation for oral surgery typically includes reviewing the patient's comprehensive medical history, measuring vital signs, and obtaining appropriate radiographs. These steps help identify risks like uncontrolled systemic disease or anatomical complexities. An echocardiogram, however, is not indicated for every surgical patient. It is reserved for individuals with specific cardiac conditions or those at high risk for cardiovascular complications. Automatically ordering an echocardiogram for every patient is unnecessary, costly, and not supported by evidence-based guidelines. Instead, selective use based on clinical findings and cardiology recommendations is the recommended approach.

5. (D) Are more susceptible to impaired wound healing

   Diabetes can compromise microcirculation and reduce immune responsiveness, making it harder for surgical wounds to heal properly. Uncontrolled blood glucose levels may slow tissue repair, leading to increased susceptibility to infection. Diabetic patients also often experience prolonged healing periods and might require more stringent antibiotic coverage or glycemic control measures to reduce postoperative complications. By contrast, those without diabetes typically have a more efficient wound-healing process. These differences underline the importance of well-controlled glycemia and careful planning for diabetic patients undergoing dental extractions or other oral surgical interventions.

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6. (B) Change to a new sterile glove promptly

Torn gloves compromise the sterile barrier essential for preventing pathogen transfer. Once a tear is noticed, the best action is to replace the glove immediately under sterile conditions. Covering it with gauze or irrigating it does not adequately restore sterility, while attempting to repair it on the spot is impractical and prone to contamination. Changing the glove ensures that the procedure can continue with minimal risk of infecting the patient or surgical site. This underscores the importance of maintaining strict aseptic protocols, which include vigilant monitoring for compromised protective barriers.

7. (C) Ensure the patient has taken antiepileptic medication and verify levels

Patients with seizure disorders require stable control of their condition to reduce the likelihood of an intraoperative seizure. Confirming that they have adhered to their antiepileptic regimen and, if necessary, verifying blood drug levels are crucial. While having oxygen on hand and consulting with a neurologist can be beneficial, these steps are secondary to maintaining therapeutic drug levels. Fasting 12 hours is typically related to sedation or anesthesia guidelines but does not specifically address seizure control. Ensuring good seizure management prior to invasive procedures improves patient safety, reduces stress, and lowers the risk of acute episodes.

8. (D) Regular use of anticoagulants or antiplatelet drugs

Medications like warfarin, dabigatran, or clopidogrel significantly increase the risk of bleeding during and after oral surgery. Awareness of these drugs allows the clinician to order necessary lab tests, such as PT/INR or platelet function assessments, and consider adjusting the medication regimen in collaboration with the prescribing physician. Asthma and corticosteroid use, while important, are more closely associated with issues like adrenal suppression or airway reactions. Over-the-counter antihistamines have minimal impact on bleeding risk. Therefore, anticoagulant or antiplatelet therapy history is vital in surgical planning and postoperative management.

9. (C) Administering prophylactic antibiotics to all patients without risk assessment

Prophylactic antibiotics are typically reserved for high-risk cases, such as patients with specific cardiac conditions or compromised immunity. Routinely giving antibiotics to every patient can lead to antibiotic resistance, allergic reactions, and other side effects. Ensuring a detailed explanation of the procedure, obtaining informed consent, and providing an intraoral antiseptic rinse are proper measures to reduce infection risk and promote patient understanding. Verifying any contraindications to local anesthetics is also crucial, especially concerning allergies or systemic conditions. Thus, automatically giving prophylactic antibiotics to every patient is the incorrect step in standard practice.

10. (C) Smoking immediately after extraction

Smoking impairs local blood flow, disrupts clot formation, and introduces heat and toxic substances into the surgical site, all of which increase the probability of dry socket. While certain systemic conditions, like uncontrolled diabetes, can predispose to poor healing, “well-controlled” diabetes does not significantly heighten the risk. Proper postoperative care, including the use of chlorhexidine mouthrinse, typically lowers the incidence of dry socket. By contrast, smoking immediately after an extraction negatively impacts clot stability and wound healing, making it a well-documented risk factor for alveolar osteitis.

11. (C) Raises the probability of intraoperative hemorrhage

Uncontrolled hypertension places undue stress on the circulatory system, causing higher intravascular pressure that can lead to excessive bleeding during surgical procedures. If blood vessels are compromised or cut, the body struggles to achieve hemostasis, prolonging operative time and raising potential risks. While local anesthetic success is not significantly impacted by hypertension, tissue damage can be more of an issue in hypoperfusion states, not hypertension. Infection risk is multifactorial, but blood pressure alone is not the primary determinant. Thus, stabilizing blood pressure before surgery is key to preventing hemorrhagic complications.

12. (B) Optimize glycemic control before scheduling surgery

Achieving stable blood glucose levels greatly reduces complications like infection and delayed wound healing. In a patient with poorly controlled diabetes, an operative procedure should ideally be postponed until glycemic levels are brought under better control. Although prophylactic antibiotics and extensive wound irrigation can help limit infection, they will not compensate for the body's compromised healing capacity when diabetes is unstable. Proper use of local or sedation anesthesia is necessary for pain control but does not address metabolic issues. Therefore, optimizing glycemic status first is crucial for safer surgical outcomes.

13. (B) Obtain periapical and panoramic radiographs

Diagnostic imaging is crucial for confirming the source and extent of an infection, especially in the mandible where anatomy is complex. Periapical and panoramic radiographs help identify the root cause—such as an abscess at the tooth apex or involvement of adjacent structures—and guide treatment planning. Empirical antibiotics might be needed, but prescribing them blindly, without clear evidence, risks antibiotic resistance and may mask underlying pathology. While blood sugar testing is wise in suspected diabetics, it does not replace radiographic assessment for localized infection. Hence, radiographs are the most appropriate next step before definitive treatment.

14. (B) Provide supplemental steroid dose to avoid adrenal crisis

Patients on long-term corticosteroid therapy can develop adrenal insufficiency, reducing their ability to cope with surgical stress. Even minor procedures can trigger an adrenal crisis if supplemental steroids are not given. Abruptly discontinuing steroids risks severe adrenal insufficiency, and simply switching to a non-steroidal anti-inflammatory drug does not address the underlying endocrine vulnerability. While the amount of supplemental steroid may vary, coordination with the patient's physician is essential to determine the correct dosage. Proactive management ensures adequate cortisol levels during the stress of surgery, minimizing potentially life-threatening complications.

15. (D) Autoclavable metal instruments

Infection control protocols require that any item contacting mucous membranes or entering sterile tissues be thoroughly sterilized or be single-use and disposed of afterward. Autoclavable metal instruments such as forceps, scalpel handles, and retractors must undergo steam sterilization or its equivalent. Light handle covers and disposable saliva ejectors, conversely, are single-use or can be protected with barriers and replaced after each patient. Patient bib clips, if not disposable, require disinfection but can be heat-sterilized depending on their material. However, the highest level of reprocessing—sterilization—is mandated for instruments with direct contact in invasive procedures.

16. (B) Undiagnosed tuberculosis

Night sweats, persistent fever, and unintended weight loss are classic red flags that can point to underlying chronic infections like tuberculosis (TB). Given that TB is contagious and can compromise overall health, diagnosing it is crucial before an elective procedure. Dental caries, vitamin deficiencies, and allergies are concerns but don't typically present with such systemic, severe symptoms. A full medical evaluation, including a chest radiograph and relevant laboratory tests, is needed to confirm or rule out TB. Proper diagnosis and management ensure patient safety and prevent potential exposure in a surgical setting.

17. (A) Persistent ulcer with rolled, indurated margins

A non-healing ulcer with rolled, firm edges is a classic presentation suggesting possible malignancy in the oral cavity. Induration reflects infiltration into deeper tissues, raising suspicion for oral squamous cell carcinoma or another malignant process. While erosions, transient swellings, and gingival bleeding can have benign causes (e.g., minor trauma, poor oral hygiene), an ulcer that persists beyond two weeks, especially with a hard border, warrants immediate investigation. Early biopsy and histopathological confirmation are critical for timely diagnosis and potentially curative management of oral cancer lesions.

18. (A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

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A thorough medical history is indispensable for identifying factors like diabetes, hypertension, bleeding disorders, or respiratory conditions that could complicate oral surgery. Undiagnosed or poorly controlled conditions heighten the risk for complications, such as infection, excessive bleeding, or anesthesia-related emergencies. By assessing a patient's systemic status and confirming stable medical management, practitioners can adapt their approach, schedule additional tests, or consult specialists. Thus, the Reason logically supports the Assertion, reinforcing that careful history-taking is not just routine protocol but a critical step in optimizing patient safety and surgical success.

19. (B) Calm, informative communication and reassurance

Most dental anxiety stems from fear of the unknown, past negative experiences, or concern about pain. Establishing rapport, explaining the procedure in clear terms, and offering reassurance can alleviate much of this anxiety. Non-pharmacological interventions often help patients feel more in control, reducing the need for deeper sedation. While IV sedation or referral to a mental health professional may be appropriate for severe, treatment-resistant anxiety, they are not the first-line approach. Physical restraint is never advised, except in rare circumstances where patient or staff safety is at risk and all other methods fail.

20. (D) Cone Beam Computed Tomography (CBCT)

Cone Beam Computed Tomography offers a three-dimensional representation of the jaws, enabling detailed visualization of anatomic structures, bone density, and pathological lesions. This higher level of detail makes CBCT particularly valuable for implant planning, locating impacted teeth, and assessing proximity to vital structures like the mandibular canal or sinus. Periapical and panoramic radiographs provide two-dimensional images, which may not fully reveal spatial relationships. Cephalometric radiographs are primarily used in orthodontics to assess skeletal relationships and growth patterns. Therefore, CBCT is often the imaging modality of choice for complex oral surgical evaluations.

21. (B) Use local anesthetic with epinephrine at low concentration

In controlled hypertensive patients, small doses of a local anesthetic containing epinephrine are generally safe and help maintain hemostasis. Epinephrine prolongs anesthesia duration, reduces bleeding, and improves visibility. While vasoconstrictor-free options reduce possible cardiovascular stress, they may provide insufficient anesthesia depth for comfortable surgical procedures, potentially leading to elevated blood pressure due to inadequate pain control. IV sedation may be considered for anxiety or extensive surgeries, but it is not mandatory in this scenario. Topical agents alone are inadequate for extractions. Thus, carefully dosed local anesthetic with epinephrine remains a common and safe protocol.

22. (B) Controlled diabetes

Though smoking and recurrent sinusitis can complicate healing, diabetes—especially if only suboptimally controlled—can profoundly affect tissue repair. Alveoloplasty requires efficient wound healing and bone remodeling for optimal denture fitting. Even "controlled" diabetes demands vigilance to ensure normal glycemic levels during the perioperative period. Poorly regulated blood glucose delays wound healing and predisposes to infection. While smoking cessation and treating sinusitis are important, glycemic control remains the most critical factor. Regular monitoring of blood glucose and possibly adjusting diabetic medications prior to surgery can help improve surgical outcomes.

23. (C) To prevent antibiotic resistance and adverse reactions

Prudent antibiotic use is essential to reduce the development of resistant bacterial strains and limit side effects, including allergic reactions and gastrointestinal disturbances. Unwarranted prescription of antibiotics fosters resistance, making future infections more difficult to treat. In oral surgery, antibiotic prophylaxis is generally reserved for immunocompromised patients or those with certain cardiac conditions, whereas routine use in all cases is discouraged. Minimizing operating room time is beneficial but not the main reason to limit antibiotics. Keeping immune cells inactive and halting tissue healing are contrary to proper surgical and medical objectives.

24. (B) A process of providing detailed procedure information and obtaining voluntary agreement

Informed consent is a foundational ethical and legal requirement. It entails explaining the nature of the procedure, associated risks, benefits, possible alternatives, and the likely prognosis to the patient. The patient then freely decides whether to proceed, ideally documented in writing. Signing a form alone does not ensure genuine understanding. It does not imply immunity from complications, nor is it merely a verbal statement without record. Proper informed consent respects patient autonomy, builds trust, and helps establish realistic expectations about outcomes and potential complications in oral and maxillofacial surgery.

25. (B) Naloxone

Naloxone is an opioid receptor antagonist that rapidly reverses the respiratory depressive effects of opioids by displacing them from their binding sites. In oral surgery or sedation settings, accidental opioid overdose can lead to dangerous respiratory compromise. Administering naloxone can quickly restore adequate ventilation. Flumazenil is used for benzodiazepine reversal, while atropine addresses bradycardia or excessive secretions. Epinephrine treats anaphylaxis or severe hypotension, not opioid-induced respiratory depression. Hence, naloxone stands out as the specific reversal agent, making it essential to keep this medication readily available during surgeries involving opioid sedation or analgesia.

26. (C) Both subjective and objective measures should be used together

Effective pain assessment requires integrating the patient's self-reported pain experience (subjective) with clinical indicators such as vital signs, facial expressions, and physical findings (objective). Neither approach alone sufficiently captures the complexity of pain, which is influenced by biological, psychological, and social factors. Subjective feedback varies greatly between individuals, yet it remains the cornerstone of pain evaluation. Objective measures can confirm or contextualize patient reports but cannot replace personal input. Recognizing this interplay ensures a more comprehensive and empathetic approach to managing discomfort during and after oral and maxillofacial surgical procedures.

27. (B) Local anesthesia with sedation, ensuring minimal respiratory depression

Patients with Chronic Obstructive Pulmonary Disease (COPD) are vulnerable to respiratory compromise. Local anesthesia is typically safer than general anesthesia, as it minimally affects airway reflexes and gas exchange. Combining local anesthesia with carefully titrated sedation offers adequate pain control and anxiety relief while minimizing sedation depth and potential respiratory depression. Avoiding anesthesia altogether can lead to increased stress and pain, further exacerbating respiratory effort. While nitrous oxide can be used cautiously, prolonged exposure or deeper levels of sedation may pose higher risks in moderate COPD.

28. (B) Erythromycin or clindamycin

In individuals with confirmed penicillin allergies, macrolides (like erythromycin) or lincosamides (like clindamycin) serve as common substitutes for prophylaxis against surgical site infections. Cephalosporins (e.g., cephalexin) can sometimes cross-react with penicillins, so clinicians often avoid them in patients with severe penicillin hypersensitivity. Metronidazole is mainly effective against anaerobes but does not provide the broad prophylactic coverage needed in many oral surgeries, especially those at higher risk for bacterial entry. Clindamycin covers aerobic and anaerobic bacteria, making it a frequently chosen alternative to penicillin for patients with allergies.

29. (C) Provide adequate visibility while preserving blood supply

Incision planning balances surgical access with tissue viability. While smaller incisions may minimize immediate trauma, they can restrict visibility and hamper accurate surgical maneuvers, increasing the risk of unintended tissue damage. Ensuring an incision allows adequate exposure reduces tension during retraction and preserves the mucoperiosteum's blood supply. Incisions should generally respect anatomical landmarks and vascular pathways, but strictly avoiding midline palatal crossing is situational, not an absolute rule. By focusing on sufficient visibility and tissue

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perfusion, surgeons can reduce postoperative complications, ensure better healing, and maintain an optimal surgical field.

30. (C) Proceeding without laboratory tests even if indicated

For patients with systemic risks—such as uncontrolled diabetes, cardiovascular disease, or coagulation disorders—laboratory tests like glucose levels, PT/INR, or complete blood counts are essential. These results guide surgical planning, timing, and the need for medication adjustments. Skipping indicated lab tests can lead to unforeseen complications, including excessive bleeding or infection. Collaborating with the patient's physician provides critical insights into systemic conditions, and modifications to the procedure or medication regimen are sometimes necessary. By contrast, ignoring these measures undermines patient safety and contravenes standard protocols for managing high-risk individuals in oral surgery.

31. (B) Extraction of teeth

Exodontia is the term used for the procedure of removing teeth from their alveolar sockets. This can be necessary due to decay, periodontal disease, or trauma that renders the tooth non-restorable. Other treatments, such as alveoloplasty, focus on reshaping alveolar bone, while cosmetic repair and periodontal surgeries address different dental issues. Although exodontia is a common procedure in dentistry, it still requires careful preoperative assessment, proper techniques, and postoperative care to prevent complications like dry socket or infections. Therefore, the core definition of exodontia remains the surgical or non-surgical extraction of teeth.

32. (C) Dental elevator

Dental elevators are designed to apply controlled leverage, loosening the periodontal ligament and expanding the alveolar bone to facilitate tooth removal. They come in various shapes to address specific tooth positions and root configurations. Periosteal elevators, while also used in oral surgery, serve mainly to reflect the mucoperiosteum. Surgical handpieces and bone chisels may be employed for sectioning teeth or removing bone in complex extractions, such as impacted wisdom teeth. However, in routine exodontia, the elevator is the principal tool for initially mobilizing the tooth prior to forceps application.

33. (C) To allow sufficient access and visibility

In difficult extractions, a well-planned flap grants the surgeon clear visualization and working space around the tooth and supporting structures. Improved access helps minimize potential damage to adjacent tissues, reduces operative time, and increases efficiency. Proper flap design also ensures adequate blood supply to flap margins, promoting better healing. Making the flap too small limits visibility, while excessively large flaps can create unnecessary trauma. The goal is always to balance operative exposure with minimal soft-tissue disruption so that healing remains optimal and complications, such as flap necrosis or infection, are minimized.

34. (C) Adequate tooth structure for forceps application

Surgical extraction is usually indicated when conventional forceps extraction is not feasible, such as with teeth lacking sufficient coronal structure, impacted third molars, or molars with divergent roots that hinder uncomplicated removal. Adequate tooth structure allows the operator to achieve proper forceps grip, often enabling a simpler, non-surgical extraction. By contrast, severely compromised crowns or difficult root anatomy typically necessitate surgical intervention, which may include creating a flap, removing bone, or sectioning the tooth. Hence, having enough tooth structure for routine forceps removal generally indicates a non-surgical approach.

35. (C) Involves bone removal or sectioning of the tooth

Open (surgical) extraction involves creating a flap and, when necessary, removing bone or sectioning the tooth to facilitate its removal. This approach is ideal when the tooth cannot be extracted with routine forceps, such as in the case of dilacerated roots or significant structural loss. By contrast, closed extraction is indicated when teeth are reasonably intact and mobile enough to be removed with standard elevator and forceps techniques. Surgical extractions typically demand more local anesthesia and a carefully planned flap, contrary to

the idea that no flap design or reduced anesthesia is required.

36. (C) Gently attempt retrieval with a root tip pick or minimal bone removal

When a small root fragment fractures, carefully removing it during the same visit generally prevents future complications such as infection or delayed healing. Excessive force with a hemostat can cause trauma to the alveolar bone or surrounding tissues, complicating the situation further. Leaving a fractured root tip in place without patient knowledge is unethical and can lead to persistent problems. While scheduling a subsequent appointment might sometimes be necessary if excessive bleeding or limited visibility hinders safe retrieval, making a careful attempt at the time of extraction is typically the most appropriate step.

37. (B) Apply controlled, gradual forces with proper support

Excessive or abrupt forces can strain the patient's TMJ and surrounding musculature, potentially causing discomfort or more severe injury. Using deliberate, controlled motions—often combining buccal and lingual pressure—allows gradual expansion of the alveolar socket and safer mobilization of the tooth. Proper support, such as stabilizing the patient's jaw, helps distribute force evenly and reduces undue stress on the joint. Instructing patients to actively move their jaw during extraction is counterproductive. Gentle, well-executed application of force fosters a more comfortable experience and lowers the risk of TMJ complications.

38. (B) Apply direct pressure with a sterile gauze pack

Persistent bleeding is best addressed first by placing firm, direct pressure on the socket with sterile gauze. This helps form a stable blood clot and often stops bleeding quickly. While suturing can help, it is usually effective only after ensuring that a clot can form or identifying a vessel that requires ligation. Antibiotics do not directly address the cause of bleeding, and dismissing the patient with ongoing hemorrhage is inappropriate. Direct pressure remains the most immediate and practical step in controlling post-extraction bleeding in the dental office.

39. (C) Maintenance of a stable blood clot in the socket

Dry socket (alveolar osteitis) often occurs when the initial blood clot dislodges, exposing underlying bone. Ensuring the formation and retention of a stable clot is critical for normal healing. Aggressive curettage can disturb clot formation, while instructing patients to rinse vigorously immediately post-extraction can dislodge the clot. Leaving the socket open without a clot leads to increased pain and slower healing. Proper postoperative instructions—such as gentle rinsing after 24 hours and avoiding smoking—support clot stability, reducing the risk of dry socket development and promoting patient comfort.

40. (C) Forcing the mouth open beyond its normal range

Overextending a patient's mouth can lead to temporomandibular joint strain or soft tissue injury, making it an inappropriate technique during extraction. A bite block can help stabilize the jaw and improve patient comfort, especially for lengthy procedures. Ensuring that the patient is adequately anesthetized is mandatory to prevent undue pain or patient movement. Slow, controlled force helps gradually expand the socket and reduce the risk of root or bone fractures. Hence, forcing the mouth open excessively is the incorrect step that can jeopardize patient safety and comfort.

41. (D) Significantly higher

Smoking impairs local blood flow and introduces nicotine into the extraction site, reducing the body's capacity to maintain a stable blood clot. This, in turn, increases the risk of dry socket and other postoperative complications. Research consistently indicates that smokers experience higher incidences of alveolar osteitis than non-smokers. While "slightly higher" suggests a minor effect, in reality, the difference can be clinically significant. Encouraging patients to refrain from smoking for a period before and after the procedure can mitigate these risks and improve surgical healing outcomes.

42. (D) In the thin buccal cortical plate of maxillary premolars

The maxillary premolar region often has a relatively thin buccal cortical plate, making it susceptible to fracture if excessive force is applied during

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extraction. The combination of leverage and bone fragility can easily result in buccal plate separation or cracking. While the lingual cortex, anterior maxilla, and sinus floor can also fracture under severe stress, the buccal cortical plate of the premolar region is the most common site due to thinner bone. Proper technique, including gradual luxation and careful force application, is critical to preserving bone integrity and minimizing procedural complications.

43. (A) Dry socket

The classic presentation of dry socket (alveolar osteitis) includes worsening pain a few days after extraction, often accompanied by a foul odor or taste. This arises from the premature loss of the blood clot, leaving exposed bone. Osteomyelitis is more chronic and severe, presenting with systemic signs of infection. Normal postoperative pain tends to improve rather than worsen days after the extraction, and an allergic reaction usually involves other symptoms such as itching or swelling unrelated to the socket. Thus, dry socket is the most probable diagnosis given the symptoms and timing.

44. (B) Attempt retrieval through the socket or a Caldwell-Luc approach

Displacement of a root tip into the maxillary sinus is a recognized complication that risks sinusitis or persistent infection if left untreated. The recommended action is to remove the fragment, typically by gently enlarging the socket or, if necessary, performing a Caldwell-Luc procedure for greater access. Abandoning the fragment within the sinus can lead to chronic issues; likewise, relying on spontaneous eruption is not a reliable solution. While a collagen membrane may help seal an oro-antral communication, the priority remains retrieving the displaced root tip to prevent sinus pathology.

45. (B) Coordinate with a hematologist to optimize factor levels

Patients with hemophilia or other bleeding disorders need their coagulation status optimized to prevent uncontrolled bleeding. Collaboration with a hematologist allows for adjusting clotting factors or administering specific therapies like DDAVP (desmopressin) if indicated. While minimal sedation can reduce stress, it does not address the underlying coagulopathy. Performing a routine extraction without preparing the patient's hemostatic status is risky, and scheduling multiple extractions in one visit could compound bleeding risks. Thus, ensuring clotting factor levels are appropriate is vital for a safe and controlled oral surgical procedure.

46. (B) Can often continue aspirin without interruption for minor extractions

Current guidelines frequently recommend continuing low-dose aspirin for minor dental surgeries because the risk of thrombotic events from discontinuation often outweighs the risk of bleeding. Aspirin causes irreversible platelet inhibition, but minor extractions can usually be managed with local hemostatic measures. Discontinuing aspirin for two weeks or bridging with heparin is generally reserved for more invasive surgeries or patients at specific risk. INR monitoring tracks warfarin or other vitamin K antagonists, not aspirin. Therefore, for straightforward extractions, patients on low-dose aspirin can usually proceed as long as appropriate local hemostatic techniques are in place.

47. (B) Ludwig's Angina

Ludwig's Angina is a rapidly spreading cellulitis in the submandibular, sublingual, and submental spaces, often originating from odontogenic infections in the lower molars. Its hallmark signs include severe swelling, potential airway compromise, and difficulty swallowing. Postoperative edema usually does not cause dysphagia, while TMJ dislocation presents differently with jaw displacement. An allergic reaction can cause swelling but is more likely accompanied by hives or respiratory symptoms like wheezing. Because Ludwig's Angina can progress quickly to life-threatening airway obstruction, recognizing and initiating emergency treatment is paramount.

48. (C) Air escaping into the mouth when the patient blows their nose

An oro-antral communication can form when the roots of maxillary posterior teeth are close to the sinus floor, resulting in an opening between the oral cavity and the maxillary sinus. Patients may notice bubbles or air escaping from the socket or taste fluid from the nose. Lip numbness typically indicates nerve involvement, and a "popping sound" is not a

hallmark of sinus communication. While bleeding can occur, uncontrollable hemorrhage is more indicative of vascular compromise. The classic sign is air passage from the sinus through the socket during nose blowing.

49. (A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Immediate dentures protect esthetics by replacing missing teeth right after extraction, preventing the sudden collapse of facial soft tissues. Simultaneously, the alveolar ridge begins to resorb once teeth are removed, changing facial contours. Because immediate dentures preserve facial support, they mitigate the psychological and cosmetic impact of tooth loss. Though relines may be necessary later as resorption continues, the advantage lies in maintaining appearance during the critical healing phase. Thus, the Reason directly supports the Assertion, explaining how alveolar resorption can negatively affect esthetics unless compensated for by an immediate prosthesis.

50. (C) Consult the cardiologist and consider delaying until the patient is medically stable

Dental extractions performed too soon after a myocardial infarction increase the risk of cardiac complications. Guidelines often recommend waiting several months, depending on the patient's condition, medications, and cardiologist's advice. Coordination with the cardiologist ensures optimized cardiac function, enabling safer scheduling. While six months is often cited as a standard waiting period for elective procedures, individual factors might allow earlier intervention. General anesthesia in a hospital setting might be indicated if the patient has severe cardiac instability, but the first step is always to consult the treating physician for risk assessment.

51. (C) A small, deliberate notch in bone or tooth surface to engage the elevator tip

During complex extractions, especially where roots resist routine forceps, an "elevator purchase point" may be created by removing a tiny bit of bone or tooth structure. This precisely positions the elevator tip for controlled leverage. By establishing a solid fulcrum, the operator can better mobilize or remove the remaining root fragments. Options like finger rests or adjacent-tooth support do matter but do not define the "purchase point" itself. Meanwhile, the injection site for anesthesia is unrelated to the mechanical principle of obtaining secure elevator access. Thus, the purchase point is a strategic notch for improved elevator grip.

52. (C) Hematoma formation in the pterygomandibular space

While rare, hematoma is a known complication when administering an inferior alveolar nerve block. If the needle inadvertently damages a blood vessel, bleeding can accumulate in the pterygomandibular space. Allergic reactions to amide local anesthetics like lidocaine are extremely uncommon, and facial nerve paralysis typically results from depositing anesthetic into or around the parotid capsule, not from standard mandibular infiltration. Displacement of the anesthetic cartridge is improbable under normal clinical protocols. Therefore, the most frequently noted complication for mandibular molar extractions is hematoma, reflecting vascular injury during needle insertion.

53. (D) Instruments can slip lingually and cause laceration to the floor of the mouth

Lower anterior extractions require delicate technique, given the relatively thin bone and limited mesiodistal space. When luxating or using forceps, an accidental lingual slip can result in significant soft-tissue trauma, especially to the highly vascular floor of the mouth. Though the lingual nerve mainly runs near the molar/premolar region, careful retraction is still crucial in the anterior area. The sublingual artery, while important, is not the sole concern. Overall, unintentional instrument movement poses a serious risk, making thoughtful retraction and controlled force essential for preserving lingual soft tissues.

54. (C) Performing unplanned multiple extractions in a single session

In medically compromised individuals—such as those with cardiovascular or respiratory conditions—minimizing surgical stress is paramount. This involves shorter appointments, monitoring vital signs closely, and ensuring oxygen is accessible if respiratory or circulatory issues arise. Unexpectedly extending a procedure to include several extractions can escalate stress,

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bleeding risk, and potential complications. Proper planning, including consultation with a physician and incremental procedures if needed, helps prevent acute complications. Therefore, while consolidated dental care can sometimes be efficient, in high-risk patients, adding multiple extractions without prior planning is strongly discouraged.

55. (B) Demands more time and possibly sectioning of roots

Molars and some premolars with multiple roots can present more complexity, especially if the roots are divergent or curved. Surgical sectioning of the crown and roots may be necessary to facilitate removal without excessive trauma to the bone. This increases both the operative time and the need for careful local anesthesia management. Postoperative discomfort can be more significant due to the invasiveness of the procedure, and alveolar complications—such as higher fracture risk—can be more frequent. Single-rooted teeth, in contrast, typically extract faster with fewer steps and complications.

56. (D) Cone Beam Computed Tomography (CBCT)

When an impacted third molar or deeply seated root is positioned near the inferior alveolar canal, two-dimensional imaging may not adequately show the nerve's spatial relationship to the tooth. CBCT provides a three-dimensional view, revealing precise proximity and orientation. Armed with this data, the surgeon can plan flap design, consider root sectioning, or decide on a coronectomy if the nerve is at significant risk. While panoramic and periapical radiographs can help identify approximate positions, they lack the detailed cross-sectional perspective needed to fully evaluate potential nerve compromise. CBCT thus remains the best choice in these scenarios.

57. (B) Proceed without altering medications and use local hemostatic measures

Discontinuing dual antiplatelet therapy can raise the risk of thrombotic events, especially if the patient has a history of cardiac stents or coronary artery disease. Most current guidelines recommend continuing such therapy for minor dental surgeries, provided comprehensive local hemostatic strategies—like sutures, hemostatic agents, and pressure packs—are employed. Switching to warfarin complicates management further, and general anesthesia isn't inherently required merely due to antiplatelet use. Consequently, continuing aspirin and clopidogrel, while carefully controlling bleeding intra- and postoperatively, aligns with the safer, evidence-based approach for straightforward premolar extractions.

58. (B) Placement of a soothing dressing or gel foam

A protective dressing (e.g., gel foam, collagen plug) stabilizes the blood clot, supports initial granulation tissue formation, and can alleviate patient discomfort. Overly aggressive curettage or extended instrumentation can remove beneficial tissue remnants and irritate the socket, delaying healing. Hydrogen peroxide is sometimes used as a disinfectant, but prolonged application may disrupt new granulation or irritate the surgical site. By contrast, a gentle, resorbable dressing fosters natural clot formation, contributing to healthy granulation and the subsequent repair process. Proper postoperative instructions complement this approach, enhancing oral hygiene and reducing trauma during healing.

59. (C) Elevating a full-thickness flap

Lower incisors often have narrow, single-root anatomy and can be extracted using careful rotational or labiolingual movements. Minimal force should be used once the tooth is sufficiently mobile to limit trauma. Inspecting for soft-tissue tears is important to prevent postoperative complications. However, a full-thickness flap typically isn't required for a straightforward incisor extraction unless complicating factors—like atypical root shape or pathology—are present. Routine incisor extractions rarely demand surgical flaps, which add unnecessary morbidity and healing time if not indicated. Thus, raising a flap for a simple, mobile incisor is the incorrect step here.

60. (C) Significantly increased

Ignoring postoperative guidelines—such as refraining from smoking, avoiding vigorous rinsing within the first 24 hours, or neglecting prescribed mouthwashes—raises the risk of dislodging the blood clot, facilitating bacterial colonization, and delaying wound healing. These behaviors can cause complications like alveolar osteitis or local

infection, which prolongs recovery and increases discomfort. The immune system offers some natural protection, but it cannot always overcome preventable mechanical disruption or high bacterial loads. Consequently, compliance with detailed aftercare instructions is essential in significantly reducing postoperative complications following any tooth extraction, particularly those involving molars.

61. (C) The alveolar socket wall

When undue lateral forces are applied, the alveolar walls—often thinner on the buccal aspect—are particularly vulnerable to fracture. This is especially problematic in areas like the maxillary premolars or mandibular anterior region, where the cortical plates can be thin. Crowns of adjacent teeth might chip if instruments slip or if inappropriate leverage is used, but the direct effect of aggressive horizontal traction is more commonly alveolar bone fracture near the extraction site. Maintaining a controlled, balanced approach—ideally applying movements that gradually expand the socket—helps avoid these sudden structural disruptions.

62. (C) Use gentle luxation to avoid bone fracture

In older patients with reduced bone density, even routine extractions risk alveolar fractures if heavy-handed forces are applied. Gentle, gradual luxation helps expand the socket slowly, allowing the tooth to loosen without excessive cortical stress. Halting antihypertensive medication could destabilize blood pressure and is typically unwarranted. Increasing force contradicts the principle of controlled traction. Withholding anesthesia introduces unnecessary pain and patient movement, which could inadvertently raise the risk of fracture. Thus, the key is a careful technique that takes into account diminished bone strength, ensuring safe tooth removal and minimized complications.

63. (A) Mental nerve

The mental nerve, which is a branch of the inferior alveolar nerve, emerges from the mental foramen to supply sensation to the lower lip, chin, and gingiva in the mandibular anterior area. Trauma or compression near the foramen—such as due to bone expansion, local anesthetic injury, or tooth root manipulation—can cause prolonged numbness or paresthesia. In contrast, the buccal nerve supplies the cheek region, the lingual nerve covers the tongue and lingual gingiva, and the glossopharyngeal nerve provides sensory innervation primarily to the pharynx and posterior tongue. Hence, lower lip and chin anesthesia implicates the mental nerve.

64. (A) Scheduling early in the morning after dialysis if needed

Patients with significant renal impairment—especially those on dialysis—often have specific scheduling needs. Dialysis typically stabilizes fluid and electrolyte balance, making the immediate post-dialysis period (or next day) safer for surgical procedures. Analgesics that are nephrotoxic or primarily excreted via the kidneys should be used with caution or modified doses. Antibiotics may still be indicated to prevent infection but must be chosen or dosed according to the patient's renal status. For patient comfort and safety, local anesthesia is generally appropriate. Thus, timing extractions around dialysis sessions is the key management consideration.

65. (B) Suture the socket with a figure-of-eight suture and reassess

Suspected oro-antral communications (OAC) require prompt attention to minimize sinus complications like sinusitis. Encouraging the patient to blow their nose can exacerbate the opening by forcing air or contaminants through the communication. Simple gauze packing is insufficient for complete closure. While small OACs (often <2 mm) can sometimes heal spontaneously, suturing with a figure-of-eight or other appropriate technique helps approximate tissue and stabilize the blood clot. This promotes healing and prevents further enlargement. If the defect is large, additional measures such as a flap or a specialized membrane may be necessary. Suturing and close follow-up remain initial best practices.

66. (C) Muscle or fascial space infection (e.g., early infection in the masseteric space)

Though dry socket can cause severe pain, it typically emerges around two to three days post-extraction rather than immediately. Trismus, or limited mouth opening, so soon after surgery raises concern for infection or inflammation involving the muscles of mastication or adjacent fascial spaces, particularly

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the masseteric or pterygomandibular spaces. TMJ dysfunction generally presents differently and is less likely to manifest acute severe pain the day after extraction. Normal healing is accompanied by mild discomfort, not sudden or intense pain and trismus. Therefore, early muscle or fascial space infection is the primary concern in this scenario.

67. (B) Palpable mobility of the surrounding alveolar process

The maxillary tuberosity is a critical support area for upper molars. An overly forceful extraction can fracture or dislodge part of this bony prominence. If the tuberosity fractures, a clinician may detect an unusual mobility or crepitus in the alveolar ridge adjacent to the extracted tooth site. Pain radiating to the lower jaw or mild bleeding is more common for routine extractions and not specific to a tuberosity fracture. Tingling in the lingual mucosa would suggest lingual nerve involvement, which typically occurs in the mandibular arch. Thus, mobility of alveolar bone is the hallmark sign.

68. (A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

A subperiosteal abscess arises when infectious material accumulates underneath the periosteum, often triggered by retained tooth fragments, bone spicules, or other debris left after extraction. The presence of these irritants can lead to inflammation, local infection, and subsequent abscess formation. The Reason precisely explains why such fragments provoke abscess development: foreign materials sustain bacterial colonization in a space otherwise sealed by periosteal adherence. Therefore, both the Assertion and Reason are correct, with the Reason appropriately accounting for how bony debris beneath the periosteum can lead to subperiosteal infection.

69. (B) Inhalation sedation with nitrous oxide and oxygen

Pediatric patients can experience heightened anxiety and limited cooperation. Inhalation sedation with nitrous oxide (often combined with oxygen) is a widely accepted method to reduce apprehension safely. Proper monitoring, equipment, and training are essential for a sedation protocol. Deep IV sedation in a non-hospital environment elevates risks, especially for children, and requires highly specialized expertise. General anesthesia in a setting without the necessary facilities is hazardous. Avoiding sedation altogether can exacerbate fear, leading to potential behavioral or procedural complications. Hence, nitrous oxide inhalation sedation is the balanced, frequently recommended choice.

70. (C) Cone Beam Computed Tomography (CBCT)

When a root fragment migrates into deeper soft tissue planes, simple two-dimensional radiographs may not precisely reveal its position. A CBCT scan provides detailed three-dimensional views, helping clinicians pinpoint the location of the fragment relative to anatomical structures like the mylohyoid muscle or submandibular gland. Standard lateral oblique or occlusal films can offer some information, but often not the clarity or accuracy needed for surgical retrieval. Cephalometric radiographs are mainly used for orthodontic assessments and don't sufficiently capture the displaced fragment in the submandibular space. Therefore, CBCT remains the gold standard for definitive localization.

71. (B) Potential nerve injury during surgical removal

Mesioangular mandibular third molars often lie near the inferior alveolar canal, increasing the danger of nerve damage if surgical access is not carefully planned. Though dry socket and infection are also concerns, the radiographic proximity of the roots to the canal escalates the risk of paresthesia. Antibiotic therapy alone will not resolve the mechanical impaction or consistently relieve pericoronitis pain. Spontaneous eruption is unlikely in adult patients with limited space. Therefore, the chief issue is preventing or minimizing nerve injury by employing meticulous technique and possible imaging like CBCT to confirm root-canal relationship.

72. (C) Surgical extraction of the impacted tooth

Recurrent pericoronitis indicates that conservative measures—like local debridement, operculectomy, or antibiotics—are insufficient for long-term relief if there is inadequate space for full eruption. Pain radiating to the ear suggests involvement of the temporomandibular area or referred pain via shared nerve pathways. Merely repeating antibiotics or removing the operculum without addressing

the underlying impaction is unlikely to prevent future flare-ups. While physiotherapy helps with temporomandibular issues, it does not solve the cause of infection in this scenario. Consequently, definitive management involves surgical extraction to remove the source of recurrent inflammation and reduce ongoing discomfort.

73. (B) Partial surgical removal of the crown while intentionally retaining the roots

Coronectomy is performed when there is a high risk of nerve injury—particularly involving the inferior alveolar nerve—if the roots of a lower wisdom tooth are too close to the canal. By removing only the crown and leaving the roots undisturbed, the procedure aims to prevent postoperative paresthesia. This approach contrasts with a standard extraction where both crown and roots are removed. Excision of the operculum (operculectomy) addresses soft-tissue coverage only, and pulpotomy or pulp extirpation involves removing pulp tissue. Coronectomy's key objective is to minimize nerve damage by reducing traction on deeply situated roots.

74. (C) No. 15 blade

A No. 15 blade is often preferred for delicate oral surgical incisions because its small, curved design accommodates restricted intraoral areas. This allows precise control when outlining a flap around impacted third molars. The No. 10 blade is larger and more suited to broad incisions on external skin surfaces, while the No. 11 blade's pointed tip is typically reserved for stab incisions or precise incisions in tight areas. A No. 12 blade, featuring a hooked design, can be useful in specialized scenarios but is less common for standard mucoperiosteal flaps.

75. (B) Facilitate removal by dividing the crown and roots

When lower third molars are impacted, sectioning allows the surgeon to separate the crown from the roots or to divide multi-rooted segments for easier extraction with minimal force. This reduces stress on the surrounding bone, lowers fracture risk, and preserves vital structures. The procedure typically lessens, rather than increases, postoperative discomfort by preventing traumatic removal attempts. While the creation of a stable blood clot is essential for healing, sectioning a tooth in no way aims to disrupt clot formation or remove excessive bone. It's a controlled step to achieve safer, more efficient removal.

76. (C) Asymptomatic fully impacted tooth with no pathology

Standard guidelines often recommend removal of impacted third molars when they lead to recurrent infection (pericoronitis), cause decay in adjacent teeth, or are associated with pathologies like cysts or tumors. However, asymptomatic, fully impacted wisdom teeth enclosed in healthy bone, not jeopardizing adjacent structures, and devoid of radiographic evidence of pathology, may not require prophylactic removal. Instead, they may be monitored periodically. Unnecessary extraction could expose a patient to surgical risks such as nerve injury or bone fracture without clear benefits, so leaving a truly asymptomatic impacted tooth is generally acceptable.

77. (C) Mandibular surgery often requires more bone removal and risk of nerve involvement

Compared to the maxilla, the mandible's denser cortical bone typically requires more extensive removal for access, particularly with deeply impacted or angulated third molars. Additionally, proximity to the inferior alveolar nerve raises concerns about paresthesia or nerve damage. In the maxilla, bone is generally thinner, facilitating somewhat easier access, though there is a risk of sinus perforation if an impacted upper molar lies close to the maxillary sinus. Thus, the notion that mandibular extractions are simpler is incorrect, as they often demand more complex bone management and present higher nerve-injury risks.

78. (B) Begin by removing bone from the distal aspect to expose the crown

Distoangular impactions typically have the crown oriented distally, making that region challenging to visualize and access. The surgeon commonly starts by reflecting a flap and removing bone from the distal side to reveal enough tooth structure for instrument application. Attempting to extract the entire tooth in a single piece without bone removal can lead to excessive force and potential complications. Luxating from the mesial side is less

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effective because it fails to address the obscured distal crown portion. Preoperative cryotherapy is not a standard step in flap creation.

79. (C) Leave the fragment in place, observe for potential complications

Retrieving a tiny, asymptomatic root fragment located close to major nerves can pose significant risk of nerve damage. If the fragment is stable, not infected, and the patient remains symptom-free, a conservative approach is often justified. Aggressive removal under hospital anesthesia is typically reserved for symptomatic or problematic fragments (e.g., ongoing infection, sinus involvement). Prophylactic antibiotics are unnecessary in the absence of infection, and prolonged analgesics without cause isn't advisable. Routine radiographic follow-ups and clinical evaluations can ensure early detection of any future complications, balancing minimal surgical trauma with patient safety.

80. (C) Include adequate anterior release to ensure visibility and prevent tension

Proper flap design is critical for visualizing the operative field, protecting adjacent structures, and allowing tension-free retraction. For maxillary third molars, incorporating an anterior relieving incision ensures that the flap can be gently mobilized, exposing bone without excessive tension at the corners. Overly short incisions impair visibility and can tear if pulled too forcefully. While preserving neurovascular bundles is essential, the greater palatine nerve typically does not course directly in the area of a typical third molar flap. Retractors are indeed necessary to safeguard soft tissues, so eschewing them would be counterproductive.

81. (D) Ignoring the possibility of relapse by not addressing any pull on the gingiva

Frenectomy involves removing or repositioning the frenal tissue to address gingival recession, diastema, or tension in lip movement. Precisely outlining the frenum and controlling bleeding through electrocautery or sutures are essential technical steps. Undermining the tissue can achieve a tension-free closure that heals smoothly. However, omitting any evaluation of residual tension or pull on the gingiva risks recurrence, as fibrous tissue can reattach, especially if the underlying muscular pull persists. Thus, the incorrect step is ignoring potential relapse without correcting the underlying tension or providing adequate postoperative instructions and follow-up.

82. (C) A patient needing a well-contoured ridge for denture fitting

Alveoloplasty reshapes bony contours after multiple extractions so that soft tissues adapt better to prostheses, like complete or partial dentures. Patients with sharp bony edges, undercuts, or uneven alveolar ridges will benefit most from alveoloplasty to create a stable, comfortable foundation. If the ridge is already smooth and adequate, or no prosthetic is planned, alveoloplasty might be unnecessary. Generous ridge height alone does not guarantee a uniform contour, and the main driver is ensuring optimal denture fit. Therefore, the likely candidate is the individual requiring a uniform alveolar ridge for subsequent prosthetic rehabilitation.

83. (B) Heightened risk of postoperative infection and bone resorption

Overly aggressive alveolar ridge reduction or repeated trauma to the bony surfaces compromises blood supply and disturbs the healing environment. Damaged tissues are more susceptible to bacterial colonization, raising infection risk. Additionally, unnecessary bone removal or mechanical stress can heighten resorption, possibly undermining the alveolar ridge height intended for prosthetic stability. This chain reaction contrasts with beneficial healing or improved bone density. Osseointegration is associated with implant placement under controlled conditions, not alveoloplasty alone. Hence, minimizing surgical trauma is crucial to preserving bone volume and preventing complications like infection.

84. (C) Alveoloplasty to smooth the ridge

Persistent discomfort with dentures often stems from an irregular alveolar ridge that creates focal pressure points, leading to mucosal ulcerations. Alveoloplasty involves removing or reshaping any bony spicules or sharp edges, which can significantly reduce denture-induced trauma. Biopsy is prudent if a suspicious lesion or non-healing area is identified; however, routine irritation points generally resolve

once the underlying ridge is contoured. Frenectomy is reserved for abnormal frenum attachments, while extracting remaining roots or fragments is only relevant if present and contributing to the irritation. Consequently, alveoloplasty most directly addresses uneven ridge concerns.

85. (C) Perform a biopsy and send the specimen for histopathological examination

Any unusual tissue encountered during oral surgery warrants careful evaluation, particularly within follicular sacs that can harbor pathologies like cysts or tumors. Merely discarding or ignoring suspicious tissue may miss early detection of serious conditions, including odontogenic cysts or neoplasms. Antibiotics treat infection but do not address potential lesion pathology, and irrigation alone cannot confirm what the mass entails. Therefore, the standard approach is to remove the sac or part of it, label it properly, and send it for biopsy. This ensures accurate diagnosis and guides further management, if necessary.

86. (C) Perform an excisional biopsy if the lesion is easily accessible

Leukoplakia can be a potentially premalignant lesion, necessitating histological evaluation. If the patch is small and amenable to excisional biopsy, removing it entirely is both diagnostic and potentially therapeutic, especially if dysplasia or early malignancy is present. Topical steroids may help certain mucosal lesions but are inappropriate without definitive diagnosis. Simply smoothing or ignoring the lesion is risky, as it might delay detecting neoplastic changes. Observing for an extended period without intervention can allow the lesion to progress if malignant changes are underway. Thus, excisional biopsy is the most prudent approach.

87. (C) Taking adequate margins to preserve lesion architecture

Biopsy technique is critical for accurate pathological diagnosis. Preserving the lesion's architecture and ensuring an adequate sample includes surrounding normal tissue for comparison. This typically involves placing the anesthetic around the lesion rather than directly into it, to prevent distortion. Instruments should be sharp to avoid mutilating the specimen. While controlling bleeding is important, excessive electrocautery can destroy diagnostic details. Maintaining clean margins and structural integrity helps the pathologist differentiate benign from malignant changes. Hence, capturing adequate margins to keep tissue architecture intact is the recommended guideline for an accurate biopsy.

88. (C) Malignant lesion requiring biopsy

An ulcer persisting beyond two weeks, especially without an obvious traumatic cause, raises concern for possible malignancy. While mechanical irritation or appliance-related sores are possible, they typically improve once the irritant is removed or correct adjustments are made. A suspected malignant lesion in the oral cavity demands prompt biopsy to rule out carcinoma or other significant pathology. Relying on a benign assumption, like a thermal burn, can delay treatment if the lesion is in fact cancerous. Therefore, immediate further investigation is warranted whenever a suspicious non-healing ulcer is encountered.

89. (B) Rapid growth with rolled, indurated borders

Rapidly enlarging lesions in the alveolar ridge, coupled with rolled or indurated (hardened) margins, are highly suspicious for malignancy or aggressive pathologic processes. Normal benign lesions often have relatively smooth, well-demarcated edges that do not rapidly expand. If an area resolves with simple antibiotics, this indicates an infectious or inflammatory cause rather than a neoplastic one. Likewise, uniform pink coloration resembling normal tissue is less worrisome. Rolled and firm edges are a red flag, prompting prompt diagnostic biopsy to differentiate benign or premalignant lesions from invasive malignancies.

90. (C) Assertion is true, but Reason is false.

Biopsy and histopathological analysis provide definitive evidence concerning a lesion's nature, making it the gold standard for suspicious oral findings. Clinical impressions can guide initial treatment plans or differential diagnoses, but color, texture, and other appearances can be misleading. Even experienced clinicians might struggle to distinguish benign changes from early malignancies based on visuals alone. Therefore, the Assertion that biopsy is definitive stands true, while the Reason

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claiming clinical appearance is "sufficient" is false. In many instances, suspicious lesions require tissue examination to confirm or exclude neoplastic or dysplastic conditions.

91. (B) Wait until permanent canines erupt and assess the space

In pediatric patients, the midline diastema may close spontaneously as permanent canines erupt, providing additional arch space and exerting natural orthodontic forces. Performing an early frenectomy without evidence that the diastema is stable can lead to scarring and relapse. A lower lingual holding arch is for mandibular arch space preservation, not maxillary diastema. Extracting central incisors would be unnecessarily drastic. Assessing the need for frenectomy after canine eruption allows clinicians to decide if the frenal attachment truly hinders closure or if orthodontic treatment combined with or without frenectomy might be more appropriate.

92. (C) Cone Beam Computed Tomography (CBCT)

CBCT scans generate detailed three-dimensional views, allowing precise evaluation of bony lesions, including cortical boundaries and internal characteristics like radiolucent or radiopaque patterns. Panoramic and periapical radiographs may give preliminary insights but lack the depth of a volumetric analysis. A lateral skull view is too broad to capture localized alveolar changes accurately. By employing CBCT, clinicians can assess the lesion's size, relationships to vital structures, and define margins for surgical planning. This information is crucial in differentiating benign processes from potentially malignant ones, guiding subsequent biopsy or definitive management steps.

93. (B) Frenectomy to release the high frenal attachment

A prominent labial frenum inserting near the gingival margin can cause tension that widens the diastema between incisors and induces gingival recession by pulling on the mucosa. A frenectomy entails excising or relocating this connective tissue band to reduce tension, potentially stabilizing tooth alignment and improving oral hygiene accessibility. Alveoloplasty is reserved for alveolar ridge contouring, whereas operculectomy applies to partially erupted molars with operculum coverage. Extracting the upper centrals is inappropriate for such a correctable soft-tissue issue. By eliminating the frenal pull, a frenectomy helps prevent further spacing and recession, enhancing periodontal health.

94. (B) Alveoloplasty to smooth the bony prominences

In an edentulous patient with prominent exostoses or sharp bony undercuts, chronic ulceration and denture instability become prevalent issues. Merely relining the prosthesis might offer partial relief but generally fails when underlying bone irregularities are significant. Without any evidence of retained roots or pathological lesions, extraction isn't relevant here. Topical corticosteroids can temporarily reduce inflammation but do not address the mechanical etiology caused by bony protrusions. By performing alveoloplasty, the surgeon reshapes and smooths the alveolar ridges, allowing better prosthetic adaptation. This intervention helps alleviate tissue trauma, enhances comfort, and stabilizes the denture for improved function.

95. (C) Using a circular blade to obtain a full-thickness sample

A punch biopsy employs a small, round, cutting instrument to extract a cylindrical core of tissue, typically including epidermal or mucosal layers, submucosa, and sometimes superficial muscle. This method is common for oral lesions when a representative full-thickness sample is needed, but the lesion is small or well-defined. Scalpel excision, fluid aspiration, and brush cytology are distinct procedures. Scalpel excision is often used for large or suspicious lesions requiring margins, whereas brush cytology is more superficial. Therefore, the hallmark of a punch biopsy is obtaining a uniform, cylindrical specimen.

96. (B) Transport medium to maintain tissue morphology

Formalin (usually 10% buffered formaldehyde) is a common fixative that preserves cellular architecture by cross-linking proteins. When placed into formalin immediately after extraction, biopsy specimens remain stable for pathological examination. Local anesthesia typically involves agents like lidocaine, while mouth disinfectants may contain chlorhexidine or related antiseptics—

not formalin. Although formalin can denature tissues, it is not intended for hemostatic effects on biopsy sites. Thus, its primary role is to keep the harvested tissue in a chemically fixed state, ensuring accurate histological diagnoses once delivered to the pathology laboratory.

97. (A) Removing the entire lesion and margin of normal tissue versus sampling part of it

An excisional biopsy aims to remove the entire lesion, often including a rim of normal surrounding tissue to ensure complete excision and accurate diagnosis. In contrast, an incisional biopsy involves taking only a representative portion, typically used when the lesion is large, suspicious for malignancy, or located such that complete removal might be overly invasive without a confirmed diagnosis. Healing time can vary in both approaches depending on lesion size and location, and neither approach inherently prioritizes malignant over benign. Full-thickness or superficial depth depends on lesion characteristics, not strictly on biopsy type.

98. (A) At the start of the procedure, before bone contouring

Biopsy first ensures that the sample is representative of the lesion in its unaltered state. Performing alveoloplasty or suturing may disrupt or distort the tissue margins, diminishing diagnostic accuracy. Waiting a week or longer introduces risk that the lesion could evolve or partially heal, making pathology assessment more challenging. Delaying biopsy also raises concerns if the lesion is malignant and requires timely intervention. By securing the specimen before bone recontouring, the surgeon preserves clarity in the tissue's morphological features, enabling prompt pathological evaluation while still completing the planned alveoloplasty in the same operative session.

99. (B) Perform gentle stretching exercises after initial healing

In frenectomy procedures, postoperative range-of-motion exercises help prevent scar contracture and reattachment, particularly once early healing is underway. Complete avoidance of speech or chewing on the site is neither practical nor typically necessary if the procedure was minor. While intermittent ice packs may limit swelling in the first day, using them continuously for 72 hours is not standard. Gentle stretching, often guided by the dentist or a therapist, helps the tissues adapt to the new, reduced tension, ensuring long-term functional and esthetic benefits. This approach minimizes relapse by maintaining a healthy, flexible attachment post-surgery.

100. (C) Using minimal traction and placing the anesthetic around the lesion

Overzealous pulling or crushing of biopsy tissue distorts cell architecture, complicating histopathological interpretation. Injecting local anesthesia directly into the lesion can likewise distort or fragment the tissue. Instead, delivering the anesthetic in a ring block or around the lesion preserves morphological features, allowing pathologists to accurately evaluate the biopsy. Artery forceps or clamps should be avoided unless absolutely necessary, and if used, must be applied gently at the periphery. Freezing with ice is not standard practice for routine biopsies. Thus, minimal traction and careful anesthetic placement ensures the sample's integrity.

101. (C) A partial fracture in which one cortex is broken and the other is bent

A greenstick fracture occurs most often in children because their bones are more flexible. It involves one cortical surface fracturing while the opposite side bends, unlike a complete fracture where both cortices fully separate. Comminuted fractures entail multiple fragments, and alveolar fractures affect the tooth-bearing portion of the jaw. A fracture that extends into the TMJ is termed an intracapsular or condylar-head fracture. By contrast, "greenstick" describes an incomplete break, much like bending a fresh, green twig that snaps on one side while remaining intact on the other.

102. (B) A horizontal fracture above the level of the nasal fossa, separating the maxilla from the pterygoid plates and nasal septum

Le Fort fractures are categorized based on characteristic fracture lines in the midface. Le Fort I is a transverse fracture that extends above the roots of the teeth, cutting through the maxillary sinuses, nasal septum, and pterygoid plates, effectively separating the maxilla from the midface. Le Fort II and III progress higher, involving the nasal bridge,

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orbits, and zygomatic regions. Fractures of the mandibular condyle and zygomatic arch lie outside the Le Fort classification. Recognizing Le Fort I helps clinicians plan for maxillary stabilization, wiring, and possible open reduction and internal fixation if warranted.

103. (C) Enhanced bone remodeling capacity and abundant blood supply in growing children

Children's bones possess robust periosteal layers and rich vascular networks that accelerate healing. Ongoing growth also boosts remodeling potential, enabling faster callus formation and fracture union. Although thicker cortical bone might protect them from certain fractures, once a pediatric jaw is broken, its superior regeneration comes from active cellular turnover and pronounced blood circulation. Conversely, in adults, remodeling is slower, and the healing pace tends to be more moderate. While pediatric masticatory muscles can be less powerful, the key factor is the child's biologically favorable healing environment, fueled by substantial blood supply and active bone growth.

104. (D) Decreased tear production

Mandibular fractures often present with malocclusion (because of disrupted dental alignment), step deformities when palpating the inferior border or alveolar ridge, and mandibular deviation during mouth opening if one condyle or ramus is compromised. Patients might also report pain, swelling, or hematoma in the affected area. Decreased tear production is unrelated to mandibular trauma; it would be more closely linked to lacrimal gland or facial nerve involvement near the orbit, which is not a hallmark of jaw fractures. Thus, decreased tear production is the incorrect or "exception" finding in this context.

105. (C) Provides immediate stabilization with rigid fixation

Open reduction and internal fixation (ORIF) involves surgically exposing the fracture site, aligning the bone segments accurately, and placing plates and screws for rigid fixation. This approach allows the patient to resume jaw function more quickly than closed reduction, where intermaxillary fixation (IMF) or other methods often necessitate extended immobilization. ORIF does require incisions, typically done under general anesthesia for complex cases. While closed reduction can avoid surgical incisions and sometimes use local anesthesia for minor fractures, it imposes longer healing periods with intermaxillary fixation. Rigid ORIF confers stability and quicker functional recovery.

106. (B) Le Fort II

"Raccoon eyes" and subconjunctival hemorrhage are highly characteristic of midface fractures extending through the nasal bridge and orbital rims, consistent with a Le Fort II pattern. This fracture line typically arches from the nasal bridge across the infraorbital rims to the pterygoid plates, creating a pyramidal shape. Le Fort I fractures manifest lower, sparing the orbits. Mandibular angle fractures affect the lower jaw and would not typically cause bilateral periorbital bruising. Zygomatic arch fractures can cause localized facial flattening or limited mouth opening but are less associated with the classic bilateral periorbital ecchymosis pattern.

107. (B) Obtain a Cone Beam CT or CT scan for three-dimensional assessment

While panoramic radiographs can reveal a fracture line, three-dimensional imaging such as Cone Beam CT or a standard CT scan provides detailed insight into fracture displacement, orientation, and potential involvement of vital structures. This is crucial for accurate surgical planning, especially in the mandible, where precise alignment of occlusion is critical. Simply placing an arch bar or attempting manual reduction without sufficient imaging raises the risk of malunion or occlusal discrepancies. Antibiotics and observation alone are inappropriate if a true fracture is present. Thus, a thorough three-dimensional assessment precedes definitive fixation planning.

108. (A) Perform forced duction testing and evaluate extraocular muscle entrapment

Diplopia in the context of a zygomatic-orbital fracture may result from muscle entrapment, commonly involving the inferior rectus if the orbital floor is implicated. Forced duction testing helps determine if the restriction is mechanical (e.g., muscle entrapment) or neurological. Based on findings, urgent surgical intervention might be

required. Simply prescribing analgesics and waiting can lead to permanent damage, while immediate closed reduction without proper imaging or tests could worsen the situation. Intermaxillary fixation is more relevant for maxillary or mandibular fractures, not for specifically addressing diplopia due to orbital involvement.

109. (B) Record occlusal discrepancies and mandibular range of motion

Mandibular fractures often manifest as disturbed occlusion due to disruptions in alveolar or basal bone alignment. Consequently, assessing how the upper and lower teeth fit together is critical. Restricted range of motion, or pain upon opening, can indicate condylar or ramus involvement. While checking tooth mobility can reveal local damage, it does not provide a comprehensive overview of the fracture. Palpating the nasofrontal suture is pertinent to midfacial trauma, and uvula deviation usually points to palatal or oropharyngeal pathology. Thus, occlusal assessment and range of motion are the key evaluative steps.

110. (C) Using a wide, approximate alignment for faster closure

Precise alignment is vital for facial lacerations involving the vermilion border, as even slight mismatches can result in noticeable cosmetic deformities. Debridement of nonviable tissue prevents infection, and layered closure addresses deep structures and mucosal edges. A "wide" approximation is careless, risking a misaligned lip contour and suboptimal healing outcome. Speed cannot compromise accuracy in such critical aesthetic regions. Thus, while ensuring proper cleaning and possibly layered sutures is standard, a hasty, rough approximation is the incorrect step when repairing vermilion border injuries.

111. (D) Inadequate immobilization and persistent motion at the fracture site

Nonunion or delayed union often arises when a fracture site experiences continuous mechanical stress, preventing stable callus formation. If the segments are inadequately immobilized, micro-movements can disrupt healing, leading to fibrous tissue instead of solid bone bridging. Compliance with postoperative guidelines, stable fixation, and good nutrition all facilitate normal bone repair. By contrast, ongoing motion—whether from insufficient fixation hardware or poor patient cooperation—greatly increases the likelihood of nonunion. Therefore, ensuring rigid or semi-rigid stabilization is paramount for a successful outcome in mandibular fracture treatment.

112. (C) Potential compromise of the airway via pharyngeal or sublingual space

Traumatic midfacial injuries can cause significant swelling in tissues around the oral cavity, oropharynx, and sublingual area. This edema can narrow or obstruct the airway, risking respiratory distress. While midface swelling doesn't directly expedite bone healing, it can increase complications. In severe cases, securing the airway becomes a top priority, sometimes necessitating advanced measures such as a surgical airway. Rather than lessening surgical necessity, acute swelling often complicates surgical exposure, requiring careful management of inflammation before or during definitive fracture repair. Therefore, edema in the midface can indeed threaten airway patency.

113. (B) Le Fort III

Le Fort III, known as craniofacial disjunction, involves a fracture line that extends through the zygomaticofrontal sutures, the orbit's lateral walls, and across the nasofrontal suture, fully separating the facial skeleton from the cranial base. Clinical findings include severe midfacial mobility (the entire face can be moved), extensive bruising, epistaxis from fracture lines near the nasal area, and dramatic facial flattening. Le Fort I and II fractures occur at lower levels of the midface, while a mandibular symphysis or zygomatic arch fracture would not cause widespread midfacial mobility or consistent epistaxis from that region.

114. (A) Inferior alveolar nerve near the mental foramen

Numbness or paresthesia in the lower lip and chin typically indicates trauma to the inferior alveolar nerve, particularly near or within the mental foramen where the nerve emerges as the mental nerve. The buccal nerve innervates the cheek mucosa and gingiva around molars but doesn't affect lip sensation. Lingual nerve involvement presents with tongue or lingual gingival numbness, not lower lip

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anesthesia. Facial nerve branches primarily control muscles of facial expression rather than cutaneous sensation in the chin area. Therefore, the inferior alveolar nerve's mental branch is implicated in lip and chin numbness.

115. (B) Extracting the third molar if it is diseased or contributing to infection risk

When a mandibular angle fracture involves a grossly carious or periodontal-compromised third molar, that tooth can hamper bone healing or become a source of infection. The usual practice is to remove such a tooth during fracture reduction, provided it does not destabilize fixation significantly. In healthy third molars with no pathology, some clinicians may opt to leave them in place if their removal jeopardizes fracture stability. However, a grossly carious tooth elevates infection risk, potentially leading to nonunion or osteomyelitis. Consequently, extracting the diseased third molar is often part of comprehensive management.

116. (B) Securing the airway and controlling hemorrhage

In trauma, especially involving facial injuries, the ABCs (Airway, Breathing, Circulation) remain paramount. Airway compromise can become life-threatening within minutes if bleeding or displaced tissues obstruct breathing. While diagnostic imaging and definitive reduction are essential next steps, they come after stabilizing the patient's airway and controlling major bleeding. Antibiotics may be indicated later to prevent infection, but not before addressing immediate life-threatening issues. Hence, standard guidelines universally emphasize ensuring a patent airway, halting severe hemorrhage, and achieving hemodynamic stability before proceeding with surgical or imaging interventions.

117. (B) Fracture of the condylar head

Persistent ear pain (otalgia) and restricted jaw movement often point to a condylar fracture, given the condyle's close proximity to the external auditory canal. An ear infection or simple muscle soreness from clenching seldom presents with acute limitation in mouth opening post-trauma. Although TMJ contusions may cause pain, a "red flag" scenario involves the possibility of a more serious underlying bony injury, such as a fractured condylar head. Early imaging and clinical assessment of the TMJ region are warranted to rule out condylar fracture and plan definitive treatment.

118. (C) Numbness in the cheek, upper lip, and side of the nose

The infraorbital nerve, a branch of the maxillary division of the trigeminal nerve, emerges onto the face via the infraorbital foramen. In zygomatic or maxillary fractures that compromise the infraorbital rim or orbital floor, the nerve can be contused or compressed. Patients typically report sensory deficits in the area innervated by this nerve: the upper lip, lateral nose, and cheek region up to the lower eyelid. Numbness of the ear or lower lip involves different nerves (auriculotemporal or inferior alveolar nerves), whereas forehead sensation is mediated by the ophthalmic branch of the trigeminal nerve.

119. (C) Assertion is true, but Reason is false.

Maxillomandibular fixation (MMF) is a common technique for stabilizing fracture segments by binding the upper and lower jaws together, promoting alignment and fracture healing. However, MMF can actually complicate airway management if the patient vomits or experiences airway obstruction because mouth opening is restricted. Therefore, while the assertion regarding its use is correct, the reason that it "ensures immediate airway security" is incorrect. Instead, it can pose airway risks, especially in unconscious or severely injured patients. Tracheostomy or alternative methods might be required if airway protection is compromised.

120. (C) Adhere to soft or semi-solid diet as advised and maintain meticulous oral hygiene

Following surgical fixation, patients usually require a short-term dietary modification—soft or semi-solid foods—to prevent excessive strain on the healing fracture. Proper oral hygiene is vital to minimize infection risk around the hardware and incisional sites. While short-term MMF might be used, it rarely extends to six months; contemporary approaches typically favor earlier mobilization for better function. Encouraging tough-food chewing immediately can disrupt internal fixation or hamper initial healing. A detailed postoperative regimen

combining diet adjustments with gentle oral care helps ensure stable union and reduces complications like infection or hardware loosening.

121. (C) CT scan of the orbits

Orbital blowout fractures commonly involve the floor or medial wall of the orbit, potentially trapping the inferior rectus muscle or orbital fat. A dedicated CT scan (axial and coronal views) reveals fracture fragments, muscle herniation, and the degree of displacement. Panoramic and occlusal radiographs target jaw-related structures and are inadequate for detailed orbital assessment. A lateral skull film offers limited detail for the orbital floor and soft tissues. Therefore, CT imaging is considered the gold standard to diagnose blowout fractures, guiding surgical planning if reconstruction or muscle release is necessary.

122. (A) Le Fort II fracture; airway patency and sinus involvement

A pyramidal midface fracture typically corresponds to Le Fort II, which spans from the nasal bridge through the infraorbital rims and extends into the pterygoid plates. Clinical indicators include numbness over the cheek via infraorbital nerve disruption, epistaxis from the nasal involvement, and a freely mobile maxilla. The main concerns in acute management include maintaining a patent airway—particularly if swelling blocks nasal passages—and addressing potential sinus damage or infection. Le Fort I involves a horizontal maxillary fracture line, while Le Fort III presents complete craniofacial disjunction. Zygomatic arch fractures focus on cheek prominence rather than midface mobility.

123. (C) Potential risk of osteonecrosis at the fracture site

Bisphosphonates inhibit osteoclast-mediated bone resorption, strengthening bone density but also diminishing its ability to remodel and heal from invasive procedures or fractures. In cases of mandibular fractures, especially with displacement, there is an increased risk for osteonecrosis if surgical intervention is needed. Failing to account for bisphosphonate therapy may lead to compromised healing. Simple observation of a significantly displaced fracture is rarely advisable, and ignoring the drug history can be dangerous. While stable fixation and appropriate antibiotic coverage are vital, the unique challenge is minimizing the risk of bisphosphonate-related osteonecrosis of the jaw.

124. (D) Sublingual hematoma

A sublingual hematoma manifests as bruising or blood accumulation beneath the tongue, often pointing to a mandibular fracture (especially in the symphysis or parasymphysis region) or severe alveolar trauma. “Raccoon sign” (periorbital ecchymosis) and “panda sign” typically refer to bruising around the eyes, whereas “Battle sign” appears behind the ear over the mastoid process, suggesting basilar skull fracture. Sublingual bruising is a telling sign of jaw injury, as direct or indirect force to the mandible can tear vessels in the floor of the mouth, creating a visible hematoma in that area.

125. (A) Zygomaticofrontal, zygomaticotemporal, and zygomaticomaxillary sutures

A “tripod fracture” typically describes a classic pattern of zygomatic complex injury involving its three major suture connections: the lateral orbital rim region (zygomaticofrontal suture), the arch area (zygomaticotemporal junction), and the infraorbital rim (zygomaticomaxillary suture). This disrupts the stabilizing points of the zygoma, leading to facial flattening, orbital rim displacement, and potential infraorbital nerve involvement. The other named structures—such as the nasal septum, pterygoid plates, or mandibular components—belong to different fracture patterns. Hence, the “tripod” fracture specifically references breaks at the zygomatic bone’s three primary articulation sites.

126. (C) Maintenance of airway, breathing, and circulation without sophisticated equipment

Basic Life Support focuses on promptly identifying cardiac arrest or inadequate respiration and initiating immediate, life-preserving measures—namely, ensuring a patent airway, supporting breathing (mouth-to-mouth or bag-mask ventilation), and providing external chest compressions. It requires minimal equipment and is performed by healthcare providers and trained laypersons alike. Advanced interventions, such as endotracheal intubation, IV fluids, vasopressors, or antiarrhythmic drugs, belong to Advanced Life Support (ALS). Thus, BLS is the

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initial, essential approach before or alongside more advanced measures, aiming to preserve oxygenated blood flow to vital organs until higher-level care can be applied.

127. (A) Epinephrine (adrenaline)

Epinephrine is the cornerstone of managing acute anaphylaxis, countering bronchospasm, vasodilation, and hypotension by stimulating alpha- and beta-adrenergic receptors. It must be administered promptly (often intramuscularly into the mid-lateral thigh) to mitigate airway compromise and cardiovascular collapse. While antihistamines (like diphenhydramine) and corticosteroids (like hydrocortisone) can be adjunctive therapies, they are slower-acting and not sufficient alone for severe reactions. Oxygen supplementation supports respiratory function, but again, it does not reverse the underlying anaphylactic process. Thus, epinephrine remains the life-saving, first-line intervention in suspected or confirmed anaphylaxis.

128. (B) Low blood sugar can lead to rapid deterioration of consciousness and seizures

In diabetic patients, either due to excessive insulin use, inadequate carbohydrate intake, or prolonged procedures, blood glucose levels can drop sharply. Hypoglycemia can escalate quickly, producing confusion, tremors, palpitations, and in severe cases, loss of consciousness or seizures. Because procedures may delay meals or cause anxiety that affects glucose metabolism, oral surgeons must be vigilant and prepared to administer a rapid glucose source if symptoms emerge. While hyperglycemia has its own risks, acute hypoglycemia progresses more rapidly to a critical state, underscoring the importance of promptly recognizing and managing it in the dental setting.

129. (C) Administer sublingual nitroglycerin

For mild to moderate hypoglycemia, the immediate response involves ceasing the procedure, measuring blood glucose, and giving a rapidly absorbable carbohydrate (e.g., glucose tablets, juice, or gel). Once levels normalize, rechecking vitals and verifying the patient's orientation and safety are essential. Sublingual nitroglycerin is indicated for angina or chest pain associated with coronary artery disease, not for treating hypoglycemia. Using nitroglycerin in a hypoglycemic patient could even worsen hypotension. Therefore, while carbohydrate administration and patient monitoring are vital, sublingual nitroglycerin is irrelevant to hypoglycemia management in a conscious patient.

130. (C) Syncope often presents with a brief loss of consciousness without prolonged convulsions

Vasovagal syncope often leads to a transient loss of consciousness due to reduced cerebral blood flow, typically lasting only a few seconds, followed by rapid, complete recovery without extended confusion or generalized tonic-clonic activity. In contrast, generalized epileptic seizures may involve vigorous muscle contractions, possible tongue biting, incontinence, and a postictal period where patients can be disoriented or drowsy. While seizures can sometimes be mistaken for fainting, the presence of ongoing convulsions, incontinence, or a prolonged recovery phase distinguishes them from the short, abrupt episodes typical of common fainting (syncope).

131. (C) Sit the patient upright and administer sublingual nitroglycerin

Angina pectoris arises from myocardial ischemia, typically signaled by chest tightness or discomfort radiating to the jaw or arm. The first-line step is to halt any stressful activity, position the patient upright (often more comfortable for breathing), and provide sublingual nitroglycerin to alleviate coronary vasospasm. Intravenous fluid is not the primary intervention, and epinephrine is used in anaphylaxis or cardiac arrest scenarios—improper use in angina can worsen ischemia by raising the heart's oxygen demand. Continuing the procedure is contraindicated, as it adds stress and can exacerbate myocardial insufficiency.

132. (B) Checking the patient's pulse rate and blood pressure

Palpitations, tremors, and anxiety can emerge from inadvertent intravascular injection of an adrenaline-containing local anesthetic or from acute panic. Assessing vital signs—particularly heart rate and blood pressure—helps clarify whether there's a physiologic spike consistent with systemic adrenaline effects (e.g., tachycardia, elevated blood pressure). While sedation or antianxiety medication

might be considered if a clear panic episode is diagnosed, indiscriminate drug administration without verification can mask vital signs or complicate the picture. Blood glucose checks are useful in suspected hypoglycemia. Nitroglycerin is for angina, not typically indicated for suspected adrenaline or panic surges.

133. (B) Perform back blows and abdominal thrusts (Heimlich maneuver) if complete obstruction is suspected

Sudden, severe airway obstruction during a procedure can indicate aspiration or foreign-body airway blockage. If the patient cannot cough, speak, or breathe, this is a complete obstruction requiring immediate intervention to expel the object. Guidelines recommend back blows or abdominal thrusts (Heimlich maneuver) in conscious adults to dislodge the obstructing item. Oxygen administration is ineffective if the airway is fully obstructed, and a chest radiograph or nasogastric tube insertion wastes critical time in an acute emergency. Clearing the airway promptly remains the first and most essential step to prevent asphyxiation.

134. (B) Reclining the chair to a supine position with legs elevated

Syncope usually stems from transient cerebral hypoperfusion, frequently triggered by anxiety, pain, or orthostatic changes. The crucial first move is restoring adequate blood flow to the brain by reclining the patient to a supine position and elevating the legs, promoting venous return. Splashing water provides minor external stimulation but doesn't address the underlying circulation issue. Dextrose is only required if hypoglycemia is confirmed, whereas forcing the patient upright worsens hypotension. Hence, placing the patient in the Trendelenburg-like posture can quickly help regain consciousness by reestablishing normal blood pressure in cerebral vessels.

135. (D) Administer subcutaneous insulin

Asthma exacerbations involve airway narrowing, mucus plugging, and bronchospasm. Stopping the dental procedure, sitting the patient upright, and instructing them to use their rescue inhaler (like a short-acting beta-2 agonist) are appropriate initial measures. Insulin has no role in bronchodilation or acute asthma management; it's used for glycemic control in diabetic patients, not for respiratory distress. Administering insulin in this context is both irrelevant and potentially dangerous if the patient's blood glucose is not low. Thus, subcutaneous insulin is the clearly incorrect step for mild bronchospasm.

136. (C) Decreased muscle tone and over-sedation leading to tongue collapse

Over-sedation reduces protective airway reflexes and muscle tone, allowing the tongue or soft tissues in the oropharynx to occlude the airway, especially if the head is not optimally positioned. In moderate or light sedation, the patient typically maintains enough muscle tone and responds to commands, minimizing obstruction risk. Throat packs and semi-supine positioning can help reduce aspiration risk, though they need proper placement and vigilance. The primary culprit behind sedation-related airway issues is the loss of pharyngeal muscle control, causing the tongue to fall back and block airflow.

137. (C) Impaired coagulation factor synthesis leading to prolonged bleeding

Warfarin acts by inhibiting vitamin K epoxide reductase, reducing the vitamin K–dependent clotting factors (II, VII, IX, and X). As a result, the body's ability to form stable fibrin clots is compromised, prolonging bleeding times. Patients on warfarin with elevated INR are more likely to experience excessive or prolonged hemorrhage after dental procedures unless appropriate precautions (like adjusting the dose or using local hemostatic measures) are taken. Low INR would indicate relatively normal coagulation, and thrombocytosis or platelet aggregation abnormalities are not primary warfarin-related issues. The key mechanism is diminished coagulation factor synthesis.

138. (B) Begin chest compressions if pulse is absent and call emergency services

Sudden collapse with abnormal respirations (snoring or agonal breathing) and an unrecordable blood pressure suggests potential cardiac arrest or severe cardiovascular compromise. The immediate step is to assess responsiveness, check for a pulse, and if absent, start high-quality CPR (chest compressions) while activating emergency medical services

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(EMS). Sublingual nitroglycerin and oral glucose are not first-line for a patient who is unconscious and possibly pulseless. Sitting the patient upright is contradictory if circulation is absent. Early CPR and rapid EMS activation remain the top priorities in suspected cardiac arrest to optimize survival chances.

139. (B) Malignant hyperthermia

Malignant hyperthermia is a genetically linked pharmacogenetic disorder triggered by certain anesthetic agents (e.g., succinylcholine or volatile anesthetics), leading to uncontrolled skeletal muscle hypermetabolism. Key features include a rapid spike in body temperature, severe muscle rigidity (often noted in the jaw), tachycardia, and potential rhabdomyolysis or organ failure if untreated. Dantrolene sodium is the specific antidote. Serotonin syndrome can cause hyperthermia and rigidity but is more associated with serotonergic drugs, while Addisonian crisis involves hypotension and electrolyte imbalances. Thyroid storm presents with fever and tachycardia but typically without marked muscle rigidity or the same anesthetic triggers.

140. (C) Intravenous diphenhydramine (or another H1 antihistamine)

After administering epinephrine for life-threatening anaphylaxis, adjunctive therapies include an H1 antihistamine (like diphenhydramine) to reduce urticaria, angioedema, or pruritus. Although corticosteroids (e.g., hydrocortisone) can help prevent protracted or biphasic reactions, antihistamines typically come next for symptomatic relief. IV acetaminophen is simply analgesic and antipyretic, not relevant for acute anaphylaxis. Oral antibiotics address bacterial infection, not allergic mechanisms. Thus, once epinephrine stabilizes hemodynamics, adding an IV H1 blocker is the second-line acute treatment to alleviate histamine-mediated effects. Corticosteroids are also useful adjuncts but act more slowly, making antihistamines the immediate next choice.

141. (B) Keep them in a designated emergency kit, regularly check expiration dates, and ensure easy access

Standard recommendations mandate an organized, clearly labeled emergency kit with critical medications (such as epinephrine, antihistamines, nitroglycerin, salbutamol inhaler, and more), stored in an easily accessible location. The contents should be inventoried periodically, ensuring no expired items remain. Keeping them in a locked, unlabeled container can create delays or confusion under stress. Oxygen and epinephrine are crucial but not solely sufficient for all emergencies. Replacing drugs purely based on a fixed interval (e.g., every five years) ignores specific expiration dates. Thus, a properly maintained and readily accessible emergency kit is essential for patient safety.

142. (B) Local anesthetic toxicity (intravascular injection)

Systemic local anesthetic toxicity can occur if a large bolus is inadvertently administered intravascularly. Early signs include metallic taste, circumoral numbness, tinnitus, confusion, or slurred speech. Seizures or cardiovascular collapse can follow if the dose is high enough. Syncope usually involves brief loss of consciousness rather than progressive neurological symptoms, whereas a migraine aura often features visual phenomena. Mild sedation might cause drowsiness but does not typically present with metallic taste or slurred speech. Thus, local anesthetic toxicity must be immediately suspected in this context and managed accordingly (e.g., airway support, lipid emulsion therapy).

143. (A) Hyperventilation syndrome

Hyperventilation syndrome develops when patients over-breathe (often due to anxiety), exhaling excessive CO_2. This leads to respiratory alkalosis, producing perioral and fingertip paresthesias, dizziness, and sometimes carpopedal spasms. It typically occurs in anxious dental patients, especially if they are fearful of pain or sedation. Hypovolemic shock manifests with pallor, hypotension, and possible fainting, not specifically perioral tingling. Airway obstruction would present with difficulty breathing, stridor, or inability to exchange air. Malignant hyperthermia involves severe muscle rigidity, hyperpyrexia, and is triggered by anesthetic agents. Thus, the described symptoms match hyperventilation syndrome.

144. (C) Assertion is true, but Reason is false.

Oxygen is a vital adjunct in many dental emergencies, including syncope, chest pain, and respiratory distress, to ensure adequate tissue oxygenation. However, it does not reduce respiratory drive in COPD patients. In fact, these individuals often rely on mild hypoxia for their respiratory stimulus due to chronically elevated CO_2 levels. Excessive oxygen can suppress their drive to breathe, potentially leading to CO_2 retention. Thus, while the assertion that oxygen supplementation is broadly beneficial stands, the reason provided (that it reduces respiratory drive in COPD patients) is incorrect in the context it's stated.

145. (B) Intravenous 50% dextrose or intramuscular glucagon

An unconscious patient cannot safely swallow, risking aspiration if given oral carbohydrates. In this scenario, IV dextrose or intramuscular glucagon provide rapid correction of hypoglycemia. Glucagon stimulates glycogenolysis, raising blood glucose without requiring venous access, while IV dextrose directly supplies glucose. Oral fruit juice or glucose tablets are appropriate for conscious patients capable of swallowing. Administering insulin would exacerbate hypoglycemia. Hence, IV dextrose or IM glucagon is the correct emergency approach to restore normal blood sugar levels when the patient cannot protect their airway or ingest carbohydrates.

146. (D) Serum lidocaine (or anesthetic) concentration level

While clinical signs are paramount in diagnosing local anesthetic toxicity (e.g., CNS or cardiovascular symptoms), measuring the actual serum concentration of the drug can confirm elevated levels. ECG might reveal arrhythmias if cardiovascular toxicity occurs, but it doesn't confirm LA absorption or concentration per se. Serum electrolytes and pulse oximetry can highlight secondary issues—like hypoxia—yet neither directly quantifies local anesthetic in the bloodstream. Therefore, obtaining a serum anesthetic level is the most definitive test, albeit rarely done acutely in a typical dental office setting. Clinically, immediate supportive measures usually take precedence over laboratory confirmation.

147. (B) Sit upright, administer sublingual nitroglycerin, and provide supplemental oxygen

Classic angina symptoms often improve with reduced cardiac workload and coronary vasodilation, achieved by resting the patient in an upright posture (improving ventilation) and administering sublingual nitroglycerin, which helps dilate coronary arteries. Oxygen can be provided to support myocardial oxygenation. Lowering the patient supine could worsen breathing in a distressed patient, and injecting epinephrine might aggravate ischemia by increasing heart rate and contractility. Rushing the extraction intensifies stress, potentially exacerbating angina. Insulin is irrelevant unless hypoglycemia is diagnosed. Thus, sitting the patient upright, using nitroglycerin, and offering supplemental oxygen are priority measures for stabilizing suspected angina episodes.

148. (C) Adjust chair to an upright position and provide controlled low-flow oxygen

COPD patients may experience acute respiratory distress if placed supine or given excessive oxygen, risking hypercapnia and suppressed respiratory drive. The safest approach is to seat them upright for easier breathing and deliver supplemental oxygen at a carefully titrated flow (e.g., 2–3 L/min) rather than high-flow. Rapidly completing the extraction while the patient is in distress endangers both airway and cardiopulmonary stability. Hyperventilation might be harmful if the patient is physically unable and could disrupt delicate homeostasis. Therefore, a calm, low-flow oxygen approach in an upright position helps stabilize breathing without jeopardizing their COPD physiology.

149. (B) Unopposed beta-2 vasodilation causing hypotension

Patients on nonselective alpha-adrenergic blockers (e.g., phentolamine) may experience paradoxical hypotension if epinephrine is administered. Normally, epinephrine's alpha effect (vasoconstriction) balances its beta-2 effect (vasodilation in certain vascular beds). When alpha receptors are blocked, the beta-2 vasodilatory action prevails, leading to a drop in blood pressure instead of the typical pressor response. This phenomenon is known as "epinephrine reversal." It's neither an exaggerated hypertensive reaction nor a cessation or tolerance to epinephrine. Instead, it's unopposed

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beta-mediated vasodilation in the presence of alpha blockade.

150. (B) Oxidized regenerated cellulose (e.g., Surgicel)

Local hemostatic agents like oxidized regenerated cellulose, collagen plugs, or gelatin sponges can be positioned inside the extraction socket to aid clot formation and reduce bleeding. Surgicel (an oxidized cellulose product) is widely used for controlling mild to moderate hemorrhage in oral surgery. Adrenaline is useful in local anesthetic solutions for vasoconstriction but not typically placed as a standalone socket dressing. Sublingual benzodiazepines are for anxiety or seizure control, and topical fluoride gel targets dental caries prevention, not bleeding. Thus, oxidized regenerated cellulose is the appropriate choice among the listed agents for local hemostasis.

151. (B) Surgical procedures performed to prepare the mouth for a prosthesis, improving tissue form and function

Preprosthetic surgery encompasses a range of interventions designed to create an optimal oral environment for dentures or other prosthetic appliances. This can include smoothing irregular bone (alveoloplasty), removing bony exostoses or tori, and correcting soft-tissue abnormalities like high frenum attachments. The goal is to eliminate anatomical interferences that compromise denture stability, retention, or esthetics. It does not simply mean extracting all teeth without a plan, nor does it exclusively serve cosmetic ends. Implant placement may be part of broader treatment but requires proper assessment and may not always be considered strictly "preprosthetic."

152. (C) Bone graft materials or bone substitutes

Alveolar ridge augmentation is performed to restore adequate height and width to the jawbone, typically facilitating implant placement or improving denture support. Surgeons may use autogenous (patient's own) bone grafts, allografts (donor bone), xenografts (bovine or other), or synthetic substitutes to rebuild deficient ridges. Gold foil fillings, gutta-percha, and fluoride gel are unrelated to surgical bone reconstruction. Gutta-percha is a root canal obturation material, and gold foil is used for restorative fillings, not for augmenting alveolar ridges. Fluoride gels help prevent caries and do not enhance bone volume in edentulous sites.

153. (B) To confirm there is adequate vertical dimension for the prosthetic components

Interarch space is the distance between the maxillary and mandibular arches when they are positioned at rest or occlusion. For implant-retained prostheses, enough vertical clearance is essential to accommodate the implant abutment, the prosthetic framework, and the final restoration. Insufficient height can compromise the prosthetic design, leading to poor esthetics, interference with mastication, and potential fracture of the restoration. While vascularization of the ridge and anesthetic needs are also important considerations, the key purpose of measuring interarch distance lies in ensuring that the final implant-supported prosthesis can be fabricated with proper dimensions and function.

154. (C) Adequate bone height and width

While certain systemic and local conditions can preclude implant therapy—like active jaw infections, ongoing osteonecrosis, or uncontrolled metabolic diseases—good bone volume (height and width) is actually a favorable criterion, not a contraindication. Uncontrolled diabetes and active periodontal disease can dramatically increase implant failure risk due to impaired healing and bacterial challenges. Bisphosphonate-related osteonecrosis can severely compromise bone healing. Hence, the presence of adequate ridge volume would rarely prevent implant placement; instead, it is a requirement. Therefore, all of the listed conditions except sufficient bone volume qualify as potential absolute contraindications.

155. (B) Offer improved masticatory efficiency and stability

Implant-supported restorations anchor into the alveolar bone, creating a stable foundation for prosthetic teeth and greatly enhancing chewing ability and comfort compared to removable dentures. This improved retention also reduces concerns about looseness or discomfort during function. However, implants demand adequate bone height and width, and a surgical procedure is required for placement—unlike removable dentures, which do not integrate

surgically. While the benefits can be substantial, the cost is often higher than conventional dentures. Consequently, the primary advantage is enhanced stability and masticatory efficiency, not a reduction in expense or the need for surgery.

156. (B) Preserve adequate ridge height and contour for prosthesis support

Preprosthetic alveoloplasty is a delicate balance between shaping the ridge for optimal denture fit and maintaining the maximum viable bone necessary for stability, retention, and future treatment options (e.g., implants). Removing excessive bone can undermine the eventual prosthesis, leading to poor support and compromised function. Flattening the ridge indiscriminately to the canal or stripping the periosteum beyond necessity jeopardizes blood supply, delays healing, and may create irreversible defects. Instead, surgeons focus on smoothing sharp edges while preserving ridge height, producing a more functional and stable base for subsequent prosthetic rehabilitation.

157. (A) Autogenous block graft harvested from the patient's own chin or ramus

Autogenous (patient-derived) bone grafts offer the biological advantage of living cells and reduced immunogenicity, often leading to predictable osseous integration and remodeling. In preprosthetic surgery, block grafts from the symphysis (chin) or mandibular ramus can provide adequate volume for alveolar ridge augmentation, facilitating subsequent denture retention or implant placement. Mixing silver amalgam with hydroxyapatite is not a recognized method, and gutta-percha is a root canal filling material unsuited for bone reconstruction. Platelet-rich plasma can aid healing but requires a scaffold or graft material to maintain shape and volume. Thus, autogenous block grafting is generally most successful.

158. (C) Place a small collagen membrane or suture to achieve primary closure

Minor soft-tissue dehiscence exposing the implant or cover screw can often be managed by gently re-approximating tissue and promoting healing over the device. Using a collagen membrane, sutures, or a combination helps achieve a new primary closure, protecting the site from bacterial ingress. Implant removal is unnecessary if stability and bone integration are not compromised. Aggressive second-stage surgery is premature, as this is only a small dehiscence. Antifungals do not address superficial tissue exposure, especially absent clinical infection. Ensuring local tissue closure usually allows the implant to heal uneventfully.

159. (B) The thickness of existing soft tissue and keratinized gingiva

Adequate keratinized mucosa and tissue thickness around implants plays a vital role in long-term periodontal health and hygiene maintenance, influencing both esthetic outcomes and functional stability. While a patient's ability to open fully is relevant to surgical access, 10 mm is extremely limited and not a universal threshold. Age alone is not a strict contraindication for implant therapy if overall health is maintained. Matching the color of adjacent crowns or restorations is primarily a prosthetic concern. Thus, ensuring sufficient soft-tissue dimensions is a key preoperative step for successful implant integration.

160. (C) Stripping the periosteum completely to ensure minimal bleeding

While surgeons need adequate exposure for alveoloplasty, completely stripping the periosteum is counterproductive. The periosteum supplies blood, nutrients, and osteoprogenitor cells essential for bone healing. Removing it extensively can compromise vascularity, slowing or preventing proper healing and potentially leading to necrosis. Proper releasing incisions, careful flap design, and tension checks help achieve necessary visibility while preserving flap health. Maintaining the flap's blood supply is paramount, and in fact, a small amount of bleeding is normal and beneficial for healing. Thus, thorough periosteal stripping is the incorrect approach in preprosthetic flap surgery.

161. (D) Significantly higher risk of implant failure

Smoking impairs microcirculation and compromises the inflammatory and healing processes, substantially increasing the chance of peri-implantitis, bone loss, and subsequent implant failure. Studies consistently show higher failure rates among smokers compared to non-smokers, with heavy or long-term smokers at even greater risk. Though individual outcomes

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vary, the consensus is that smoking remains a significant negative factor affecting implant success. Conversely, non-smokers exhibit better soft-tissue response and bone remodeling, leading to improved osseointegration and stability over time, which underscores the markedly higher failure rates in smokers.

162. (B) Thermal injury and compression necrosis around the implant site

Dense bone requires careful preparation, often with copious irrigation and controlled insertion torque. Overly aggressive placement or skipping incremental drilling can cause frictional heat buildup, dehydrating bone cells and causing thermal injury. Additionally, excessive torque compresses the bone beyond its physiological limit, creating areas of microfractures or compression necrosis, compromising initial healing. While primary stability is desirable, it should be achieved under safe torque levels to maintain viable bone at the implant interface. Hence, forceful insertion does not necessarily guarantee success; it can lead to localized necrosis and hinder osseointegration.

163. (C) Ridge splitting or bone grafting prior to implant insertion

A severely resorbed anterior mandible with only 2–3 mm of width is inadequate to house a conventional implant. Ridge splitting or augmentation with bone grafts (autogenous, allograft, or combination) can expand or rebuild the alveolar crest, ensuring sufficient bone volume for stable implant placement. Simply using short implants doesn't address inadequate width, and additional alveoloplasty would only worsen the deficiency. Although a removable denture may be a fallback option, the question specifically addresses achieving implant support. Therefore, ridge splitting or appropriate grafting is essential for a successful implant outcome in this narrow ridge scenario.

164. (C) Valsalva test, observing for air bubbles or fluid passage through the socket

An oro-antral communication after sinus lift surgery can be quickly assessed using a modified Valsalva maneuver: the patient gently attempts to exhale against a closed nose while the clinician observes for air escape or bubble formation at the surgical site. This indicates an opening into the maxillary sinus. Transillumination or an MRI of the TMJ are not standard immediate tests for detecting sinus communication. Forcing the patient to blow their nose with nostrils pinched can create excessive sinus pressure, risking further tissue disruption. Hence, the gentle Valsalva test is a straightforward, quick diagnostic maneuver.

165. (B) Remove the implant, debride the area, and consider future re-implantation once healed

Mobility, infection signs (suppuration), and radiographic peri-implant bone loss at an early stage suggest a failing or infected implant lacking stable osseointegration. Attempting to tighten the implant or relying solely on mouthrinses cannot resolve underlying infection or reestablish lost bone support. Splinting may mask mobility temporarily but does not eliminate infection. The best approach is to remove the failing implant, thoroughly debride the infected site, and allow healing—possibly augmenting bone if needed. Once the area stabilizes and tissues recover, a subsequent implant placement might be considered under improved conditions. Early aggressive management prevents further bone and tissue compromise.

166. (B) It requires high initial stability and favorable occlusal conditions

Immediate loading—placing a prosthetic restoration on an implant right after or within days of surgery—relies on solid primary stability (often measured by insertion torque or ISQ values) and an occlusal scheme that does not overload the implant. Without sufficient stability, micro-movements can disrupt early osseointegration, leading to failure. This technique does not circumvent the biologic healing process; rather, it must harmonize with the bone's capacity to integrate. Age alone is not the determining factor for immediate loading, and it is not universally applicable to every implant scenario.

167. (C) Peri-implantitis

Peri-implantitis is characterized by inflammatory bone loss around an osseointegrated implant, often presenting with bleeding on probing, suppuration, and sometimes pain or discomfort. Radiographs typically reveal progressive bone loss, and patients may notice bad taste or drainage. A

normal remodeling process would not present with purulent discharge or significant vertical bone loss. While allergic reactions can occur, they are rare, and sinusitis typically manifests with sinus-related symptoms if the implant is near the maxillary sinus. Thus, peri-implantitis is the primary red-flag pathology that demands urgent evaluation and possible intervention.

168. (C) Stable graft volume with trabecular continuity on imaging

Over time, a well-incorporated bone graft remodels and integrates into the host bed, showing continuity in trabecular patterns and minimal resorption radiographically. Palpation or clinical observation should detect stable volume without persistent mobility or inflammation. Pronounced resorption indicates incomplete incorporation or infection, while sinus tract formation or localized swelling suggests possible graft failure or underlying infection. A stable, intact graft with radiographic evidence of progressive remodeling and new bone formation is the hallmark of successful healing. This provides a robust foundation for future prosthetic or implant procedures.

169. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Historically, subperiosteal implants were used for patients with insufficient alveolar bone, resting on top of the jawbone and under the periosteum. However, advanced grafting techniques and reliable endosseous implant designs made them obsolete. Subperiosteal frameworks are difficult to fabricate, prone to higher infection rates, and can cause bone resorption under the metal framework. Endosseous implants, integrated within the bone, carry a more predictable prognosis and fewer complications. Thus, the Reason (higher risk of infection and bone loss) logically explains why subperiosteals are now rarely employed.

170. (B) Coronally positioned flap or free gingival graft to increase keratinized gingiva

Inadequate keratinized mucosa around implants can lead to soreness during cleaning, plaque accumulation, and higher risk of peri-implantitis. Surgical augmentation of the soft tissue—often a free gingival graft or a connective tissue graft—helps create a wider band of keratinized tissue to protect the implant and promote better oral hygiene. Discontinuing brushing jeopardizes peri-implant health, and removing a functioning implant is unnecessary if the only issue is insufficient gingival width. Subperiosteal implants are outdated and have no role in addressing soft-tissue deficits. A graft-based approach is widely recognized for improving tissue health.

171. (C) Cone Beam Computed Tomography (CBCT)

Achieving an accurate understanding of alveolar ridge dimensions is essential for planning bone grafting procedures. CBCT generates a three-dimensional representation, detailing buccolingual width, height, and anatomical landmarks like vital nerve canals. Periapical or panoramic radiographs provide limited two-dimensional views, which can underrepresent or distort ridge contours. A lateral skull radiograph is typically used for orthodontic or orthognathic assessments, not precise alveolar ridge measurements. Therefore, CBCT is the gold standard for visualizing the recipient site, designing the graft approach, and predicting potential pitfalls in preprosthetic bone augmentation procedures.

172. (D) Transosteal (mandibular staple) implant, crossing the inferior border

When the posterior mandible is severely atrophic, standard endosseous or even short implants might not achieve sufficient stability or length. A transosteal (mandibular staple) implant traverses the entire thickness of the mandible from the inferior border, providing stability in cases of advanced resorption. Zygomatic implants are specific to the maxilla, anchoring into the zygomatic bone for upper arch support. Blade implants have largely fallen out of favor due to technique sensitivity and less predictable long-term success. Thus, the transosteal approach is a specialized but recognized option for lower arch rehabilitation in profoundly resorbed mandibles.

173. (C) Placing standard implants with careful surgical technique, possible staged loading

Despite moderate smoking and controlled diabetes, many patients can still achieve successful implant outcomes if surgical protocols minimize trauma and optimize healing. Staged loading (placing the

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implants, allowing time for osseointegration, and later connecting the prosthetic components) reduces risk by avoiding immediate stress on healing bone. Complete refusal to proceed until indefinite smoking cessation is often impractical, though smoking reduction or cessation counseling is advised. Immediate loading demands higher initial stability and near-perfect healing conditions, which might be jeopardized by smoking and diabetes. Zygomatic implants are typically reserved for severe posterior maxillary deficiencies.

174. (A) Free fibula flap reconstruction of the mandible

Large mandibular continuity defects compromise form, function, and the possibility of stable prosthetic rehabilitation. A free fibula flap provides robust vascularized bone for rebuilding mandibular continuity and can later host dental implants once healing and remodeling occur. Soft tissue graft alone is insufficient to replace substantial bone loss. Extra-short implants may still lack enough bone for reliable stability in a major resection site. Gold mesh alone does not provide a stable osseous framework for long-term load-bearing. The fibula flap thus remains a mainstay for reconstructing extensive mandibular defects in preparation for implants.

175. (B) A surgical guide used to position implant drills and indicate desired prosthetic tooth location

Surgical stents or guides help translate prosthetic planning into precise implant placement. They replicate the desired tooth positions, angulations, and occlusal relationships, guiding the surgeon's drills and ensuring implants align optimally with the planned restoration. While alveolar measuring devices exist, they are not called "stents." Placing sinus stents or using specialized containers for graft materials have different purposes and are not typically referred to as stents in implant dentistry. Thus, a preprosthetic stent's key function is to accurately mark where implants should be placed to support the intended prosthetic outcome.

176. (A) Bone condenser or osteotome

Osteotomes and bone condensers are specialized instruments that gently manipulate the alveolar bone, widening a narrow ridge and creating a more suitable environment for implant placement. They work by compacting or expanding trabecular bone rather than removing it, preserving bone volume. Orthodontic band pushers and periodontal scalers have no role in ridge expansion; they are used for seating orthodontic bands and removing calculus, respectively. A gutta-percha spreader is specific to endodontic procedures, not implant or preprosthetic surgery. Hence, the correct instrument for condensing or expanding alveolar bone is the osteotome/condenser.

177. (C) To allow submerged healing and osseointegration before abutment placement

A traditional two-stage approach involves placing the implant fixture beneath the gingiva, covering it, and allowing a period of undisturbed osseointegration. After a few months, a second procedure exposes the implant for abutment connection. This submerged healing design can minimize micromovement and reduce contamination risks, leading to higher success rates, especially in compromised bone or high-risk patients. By contrast, immediate loading or single-stage protocols place a healing abutment or provisional restoration from the outset. While cost and anesthesia usage vary, they are not the primary reasons for choosing a two-stage protocol.

178. (C) Less stable chewing surfaces than conventional dentures

Implant-supported overdentures frequently offer more stability, retention, and comfort compared to conventional dentures that rest solely on mucosa. Patients often report better phonetics, mastication, and psychological confidence. By transmitting functional forces through the implants and supporting bone, ongoing resorption tends to be reduced relative to tissue-supported appliances. Thus, claiming they have "less stable chewing surfaces" is contrary to documented benefits. In fact, the increased stability is a chief advantage, promoting better function and patient satisfaction. Therefore, the statement about decreased stability is the incorrect or "negative" choice.

179. (B) Sit between bony segments to increase height

Interpositional grafts are positioned between segments of bone, such as in the Le Fort I or alveolar osteotomy sites, elevating the alveolar segment to gain vertical height. This differs from onlay grafts, which rest on the external surface of the existing

ridge. Both types aim to restore sufficient ridge volume, but they differ in technique and indications. Onlay grafts are used on the outer cortex, while interpositional grafts physically separate and elevate bony segments. They do require surgical exposure and stable fixation, and they can address either horizontal or vertical deficits depending on the procedure.

180. (B) Adjust or replace the attachment components for a tighter fit

Implant overdentures rely on retentive attachments (e.g., locator abutments, bar clips) that can wear down or loosen over time, causing denture instability and clicking sounds. Replacing or adjusting the worn components often restores adequate retention without invasive procedures. Removing well-integrated implants or extracting opposing teeth is unnecessarily extreme if the root cause is simply attachment wear. While imaging can be informative for advanced complications, the most direct solution for mechanical looseness is to address the retention hardware. Thus, evaluating and correcting the attachment design is typically the first step.

181. (C) Sneeze with the mouth open to reduce sinus pressure

Following a sinus lift procedure, patients should avoid creating high sinus pressures that might disrupt the graft or membrane. This includes refraining from vigorous nose blowing and carefully sneezing with an open mouth to decrease the force transmitted to the sinus cavity. Using straws can also produce negative intraoral pressure, risking sinus membrane displacement or opening. While antibiotic protocols vary, many clinicians prescribe antibiotics to minimize postoperative infection risk, not necessarily avoid them. Therefore, the crucial patient instruction is to reduce any sudden pressure changes in the sinus, including sneezing with the mouth open.

182. (B) Place a rigid membrane or stabilization method to support the fracture

If the buccal cortex fractures during ridge expansion, simply forcing expansion further can worsen the split and endanger graft or implant success. Instead, the surgeon can stabilize the fracture by applying a membrane or fixation screws or by placing a carefully contoured bone graft to hold the segments in place while healing occurs. Abruptly abandoning implant therapy may not be necessary if stabilization is feasible. Using restorative composite is not appropriate for bony fractures. The key is to protect the site against unwanted movement and contamination, allowing bone healing to proceed and preserving the planned augmentation.

183. (C) Probing depths around the implant and bleeding on probing

Peri-implantitis is characterized by an inflammatory process, bone loss, and pocket formation around an implant. Clinically, increased probing depths—along with bleeding or suppuration—are primary indicators of peri-implant inflammation. Crown color mismatch is an esthetic issue, not a sign of infection or bone loss. An implant site still maintains a gingival sulcus or peri-implant crevice, though it may differ from a natural tooth's sulcus shape. Uneven occlusal contacts can lead to mechanical overload but do not, by themselves, confirm peri-implantitis. Thus, probing depths and bleeding are critical diagnostic indicators.

184. (D) Encouraging vigorous brushing directly over the sutured area immediately

Postoperative care following bone graft surgery typically includes protecting the site from mechanical irritation or plaque accumulation. However, recommending vigorous brushing over fresh sutures can disrupt the graft, cause soft-tissue trauma, and jeopardize flap stability. Light rinsing, using antiseptic mouthwashes, and instructing the patient in gentle hygiene measures are safer. Smoking cessation is crucial because nicotine and reduced blood flow hamper bone healing. Providing a supportive dressing or stent can help protect the area from external forces. Thus, aggressive brushing of the surgical site is the incorrect post-graft management step.

185. (C) Significantly increased

Poorly controlled diabetes compromises wound healing, reduces immune response, and impedes microcirculation. As a result, bone remodeling and integration around an implant can be impaired, increasing the risk of peri-implant infections or

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failure. Although implants are not automatically contraindicated, patients with uncontrolled diabetes face a substantially higher risk of complications compared to those with stable glycemic control. Appropriately managed diabetic individuals can achieve success rates closer to non-diabetic patients. However, if hyperglycemia remains uncontrolled, the chance of postoperative infection, delayed healing, and ultimate implant failure is notably higher.

186. (C) Loosening of abutment screws and possible crestal bone loss

Cantilevering in implant dentistry refers to extending a pontic or prosthetic tooth beyond the last supporting implant. This design concentrates stress at the implant-abutment interface, risking screw loosening or fractures, and may accelerate bone loss around the implant neck. Chronic high torque from occlusal forces aggravates mechanical and biologic complications. Increased bone density or thicker tissues are not typical outcomes under excessive load. Mental nerve anesthesia results from surgical or traumatic injury near the nerve, not purely from mechanical stress. Consequently, screw loosening and crestal bone resorption are the recognized sequelae of excessive cantilever forces.

187. (B) Abutment screw loosening

When the prosthetic crown is mobile, yet the underlying implant fixture remains immobile, the issue commonly lies in the abutment screw or the retention mechanism between abutment and implant. This can happen due to occlusal overload, improper initial torque, or mechanical wear. Implant fractures generally cause fixture-level mobility or pain. Peri-implant bone loss can lead to an overall mobile implant, not just a loose crown. Soft-tissue hyperplasia might affect gingival contours but does not typically present as crown mobility. Hence, a loose abutment screw is the prime suspect in this scenario.

188. (B) Normal early healing with partial gap fill still pending

During the early healing phase, small radiolucent gaps might remain between the implant surface and newly forming bone, particularly if the osteotomy was slightly oversized or the bone had lower density. Over time, remodeling processes fill these spaces with new bone, assuming no infection or implant mobility is present. If the gap was large or infection sets in, that changes the prognosis. A stable implant, however, suggests the start of successful osseointegration. Immediate removal is warranted only if clinical or radiographic signs point to failure or infection. Consequently, partial gap fill is not necessarily pathological at two months.

189. (C) The volume of bone needed and soft-tissue expansion requirements

Alveolar distraction osteogenesis gradually stretches both bone and soft tissue, producing new bone in the process. It's particularly helpful when significant vertical augmentation is required and the soft tissues must also expand. Block grafting, conversely, might be more suitable for smaller defects or localized augmentation where less tissue expansion is required. Factors such as sedation type, melanin pigmentation, or orthodontic involvement are unrelated to the fundamental choice between distraction osteogenesis and block grafting. Hence, the deciding factor typically revolves around how much ridge height or contour correction is necessary and the tissue's capacity to accommodate it.

190. (B) Meticulous debridement of the socket and an intact bony wall

Immediate implant placement in a fresh extraction site demands proper socket preparation. This includes removing any granulation tissue, debris, or infection. Ideally, the alveolar walls should be intact to ensure adequate implant stability and facilitate bone healing around the implant surface. Some clinicians may use local grafting or barrier membranes if gaps are present. Antibiotic coverage often depends on individual risk factors and clinician preference; it's not universally contraindicated. Implants placed into a fully healed ridge is a separate approach, not the definition of immediate placement. Therefore, thorough debridement and intact socket anatomy are essential.

191. (C) Graft infection or failure

Persistent swelling with redness, pain, or foul odor strongly suggests an infectious process compromising the graft site—commonly known as graft failure if untreated. Normal postoperative

edema usually improves within a few days, whereas infection signs often escalate. A well-integrated graft does not present with foul odor or extensive inflammation. Soft tissue graft healing has a different clinical appearance, generally showing gradual adaptation of the graft without pronounced exudate. Consequently, such marked local symptoms after alveolar grafting raise the possibility of bacterial contamination or necrosis, needing prompt evaluation and intervention.

192. (C) Ulceration and repeated trauma from the prosthesis

A palatal torus is a bony growth on the palate. If it's asymptomatic and does not interfere with speech or denture adaptation, surgical removal may not be necessary. However, if the torus becomes regularly traumatized by a denture or shows ulcerations, it indicates that the prosthesis cannot seat comfortably or that repeated friction is damaging tissue. Under these circumstances, removing or reducing the torus is essential to prevent chronic sore spots or non-healing lesions. Stable and asymptomatic tori often remain untreated unless future prosthetic plans demand a smoother palate.

193. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Studies have shown that implants in the posterior maxilla face challenges due to trabecular bone of lower density, potential sinus proximity, and thinner cortical plates. In contrast, the anterior mandible typically exhibits denser cortical bone, aiding primary stability and fostering stronger osseointegration. Therefore, the lower success rates in the posterior maxilla can indeed be explained by these bone characteristics (the Reason), which clarifies the Assertion. Practitioners often compensate with sinus lifts, bone grafts, or specially designed implants in the upper posterior region to enhance stability and long-term success.

194. (C) Reduction of the undercut via fibrous tissue excision or relocation, possibly with mucosal graft

Some edentulous ridges develop excessive soft-tissue folds or undercuts that complicate denture insertion and removal. Surgical correction typically entails excising or reshaping the redundant fibrous tissue, restoring a smoother contour. If volume is lost in the process, mucosal or connective tissue grafting can restore a functional vestibule. Electrocautery alone might address small areas but often fails to correct significant undercuts. Deepening the sulcus without removing obstructive fibrous tissue may not eliminate the bulge. Excessive bone removal is not indicated if the main issue involves soft-tissue overgrowth or undercut.

195. (B) Water's (occipitomental) view or CT scan of the sinuses

Patients with prior sinus surgery need thorough evaluation of sinus anatomy and health, especially if an implant or sinus lift is planned in the posterior maxilla. A Water's view (occipitomental radiograph) visualizes the maxillary sinuses, detecting any opacification, mucosal thickening, or structural changes from past interventions. A CT scan offers even more detail, revealing residual pathology or anatomical variations. Lateral cephalograms, bitewings, or a panoramic film limited to the mandible lack the comprehensive sinus detail required to guide safe and effective implant planning in the upper jaw post sinus surgery.

196. (B) Ensuring uninterrupted healing and stronger osseointegration prior to abutment placement

The two-stage protocol aims to protect the implant's initial healing phase under the mucosa, reducing mechanical stresses and bacterial ingress. This is especially beneficial in moderately resorbed ridges where bone volume or density might be less than ideal. Once osseointegration is confirmed—usually after several months—a second surgery exposes the implant, allowing placement of the abutment and subsequent prosthesis. This approach helps achieve more predictable outcomes, not necessarily speeding up treatment or lowering costs. Local anesthesia is still needed for both stages, and overall procedure time is longer, but with enhanced certainty of stable integration.

197. (C) Antibiotic coverage and limited mechanical stress on the graft site

Postoperative protocols for ridge augmentation emphasize infection control, typically achieved through prophylactic antibiotics, careful oral hygiene, and gentle rinsing. Additionally, mechanical stresses—such as heavy chewing

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or direct pressure—could disrupt the graft site, causing micromovement or structural compromise. Smoking reduces blood flow, inhibiting bone healing, and is strongly discouraged. Analgesics are typically prescribed to manage pain and encourage compliance with protective measures. Thus, providing antibiotic coverage to prevent infection, advising the patient to avoid masticatory forces on the grafted region, and maintaining overall healthy oral hygiene are key to successful graft incorporation.

198. (B) Loading the implant with a functional provisional or final prosthesis within one week of placement

Immediate loading involves placing a restoration—often a temporary crown—onto the implant fixture very soon (hours to days) after surgical placement, allowing the patient to have functional or esthetic benefits without long waiting periods. Conventional protocols typically require three to six months before final loading. Avoiding any prosthesis for extended periods is not immediate loading, while zero occlusal contact for 12 months is an extended healing approach. Thus, the hallmark of immediate loading is providing a functional or semi-functional prosthesis quickly, commonly within the first week post-implant surgery.

199. (A) Low speed (around 800–1200 rpm) with copious irrigation

Implant site preparation must minimize heat generation, which can injure bone cells and inhibit osseointegration. Drilling at lower speeds (commonly around 800–1200 rpm) combined with continuous saline irrigation reduces frictional heat buildup. High-speed handpieces designed for restorative work can exceed 200,000 rpm and are typically not used for bone drilling in implantology. Reverse rotation or minimal torque without irrigation is ineffective and risks bone or drill damage. Hence, the recommended protocol centers on controlling drilling speed, applying adequate pressure, and using ample irrigation to keep temperatures within safe limits.

200. (B) The shape and contour at which the prosthetic crown emerges from the soft tissue

Emergence profile describes the transition zone of a restoration as it exits the gingival tissues, influencing both esthetics and hygiene accessibility. A proper emergence profile mimics natural tooth contours, preventing plaque accumulation and promoting healthy peri-implant tissue. Though color matching, healing times, and antibiotic regimens are all parts of implant planning, they do not define emergence profile. By designing an optimal soft-tissue contour around the implant abutment, the prosthesis appears natural and reduces the risk of soft-tissue inflammation. Hence, emergence profile specifically focuses on how the crown “emerges” through the gingiva.

CHAPTER 04

PEDODONTICS

1. (B) An increase in the structural size and mass of the body or its parts

   Growth refers to a quantifiable and measurable increase in the body's physical dimensions, such as height and weight, or an expansion in cells and tissues that results in overall size increment. This process is distinct from development, which focuses on the refinement and enhancement of function or skill. Option (A) is incorrect because it omits numerical changes. Option (C) describes development more than growth, emphasizing functional maturity. Option (D) is incorrect as growth is not typically reversible after adolescence. Hence, the correct choice under pediatric dentistry considerations is (B).

2. (A) Bud stage

   The bud stage is the earliest visible stage of tooth development, where the dental lamina proliferates into distinct buds that will form the enamel organ. This stage is mainly marked by a clustered group of cells that project from the dental lamina into the underlying mesenchyme. The cap stage (option B) follows and is identified by the formation of an enamel organ resembling a cap. The bell stage (option C) features histodifferentiation and morphodifferentiation. The apposition stage (option D) is when hard tissues, such as dentin and enamel, start depositing.

3. (B) It reflects both qualitative and quantitative refinements in function

   Development in children incorporates not only the observable, measurable changes in body dimensions but also the maturation of body systems and skill acquisition. This includes the progressive honing of neuromuscular control, cognitive abilities, and emotional responses. Option (A) is incorrect, as development encompasses more than just physical changes. Option (C) defines growth more than development, focusing on cell count and size. Option (D) is invalid because development follows a fairly predictable sequence, guided by genetic and environmental factors. Pediatric dentistry acknowledges that understanding development is crucial to addressing children's oral health effectively.

4. (C) Socioeconomic status

   Primary tooth eruption timing depends on several intrinsic and extrinsic factors. Genetic predisposition (B) strongly affects eruption sequences within families. Nutritional factors (A) also play a role; malnourished children often experience delayed eruption. Endocrine function (D), particularly thyroid and growth hormone levels, influences the speed at which teeth erupt. Socioeconomic status (C) can indirectly affect nutrition or healthcare access, but by itself, it is not a direct physiological factor in determining eruption timing. Therefore, among the listed options, socioeconomic status stands out as the least recognized direct influence.

5. (B) Primary teeth have thinner enamel compared to permanent teeth

   Primary teeth generally exhibit thinner enamel, making them more susceptible to dental caries and wear. Thinner enamel in children's teeth highlights the need for more vigilant preventive care. Option (A) is incorrect because permanent teeth typically present with thicker, more mineralized enamel. Option (C) is not correct, as histological studies confirm a difference in enamel thickness. Option (D) wrongly suggests that only primary molars might exceed permanent teeth in enamel thickness, which is not supported by standard morphology references. Thinner enamel is a defining characteristic of primary dentition that influences treatment planning.

6. (C) Mandibular first molar

   In a typical eruption sequence, the mandibular first permanent molars ("6-year molars") commonly

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appear before other permanent teeth. They often emerge around age 6, heralding the mixed dentition phase. Maxillary first molars typically erupt shortly thereafter, making (D) not the most common initial arrival. Anterior teeth like the maxillary central incisor (A) and mandibular lateral incisor (B) erupt slightly later. Recognizing this usual sequence is vital in pediatric dentistry to monitor developmental progress and identify potential eruption disturbances or crowding issues, ensuring appropriate interventions and guiding growth modification techniques when necessary.

7. (B) Hyperthyroidism

Hyperthyroidism can lead to increased metabolic activity, including hastened bone turnover, resulting in early tooth exfoliation. Although hypothyroidism (A) can affect eruption timing, it typically delays rather than accelerates tooth exfoliation. Juvenile diabetes mellitus (C) can cause varied oral manifestations but does not commonly present as uniformly accelerated tooth loss. Vitamin D-resistant rickets (D) typically affects tooth mineralization rather than exfoliation timing. Early detection and management of hyperthyroidism are important in a pediatric context because normal dental development can be severely disrupted by systemic endocrine abnormalities.

8. (B) Panoramic radiographic evaluation

When a child shows delayed tooth eruption, a panoramic radiograph is a critical first-line investigation. It allows assessment of tooth follicle presence, eruption path, potential impaction, or any anomalies in tooth germ structure. This step precedes invasive measures such as surgical exposure (A) or extraction (C), which could unnecessarily harm developing teeth or supporting structures if done without diagnostic confirmation. While endocrine consultations (D) might become relevant if a systemic etiology is suspected, the initial step is to obtain radiographic data to rule out local issues and guide further management.

9. (B) Differentiation of ameloblasts and odontoblasts

During the bell stage, histodifferentiation and morphodifferentiation occur, leading to the specialization of cells into ameloblasts (enamel-forming cells) and odontoblasts (dentin-forming cells). This stage shapes the crown's future contour. Option (A) describes the bud stage. Option (C) usually begins after the crown has formed, in the later stages of tooth development. Option (D) refers to the disappearance of the dental lamina remnants, an event not specifically central to the bell stage. Identifying these key cellular differentiation processes is fundamental for understanding normal and abnormal tooth formation.

10. (C) The maxillary canines erupt before the premolars

In the usual eruption pattern, premolars tend to appear before the maxillary canines. Maxillary and mandibular central incisors (A, B) follow a standard sequence, with mandibular centrals usually preceding maxillary centrals. The first permanent molars (D) often come in around age 6, initiating the mixed dentition phase. Stating that maxillary canines erupt before the premolars (C) is incorrect. The maxillary canines typically erupt after the premolars, generally around 11 to 12 years of age, though variations exist. Recognizing these patterns helps in diagnosing anomalies or crowding that might require orthodontic intervention.

11. (A) Mandibular central incisor

The primary mandibular central incisors are generally the first to exfoliate, typically around 6 to 7 years of age, corresponding to the eruption of their permanent successors. Primary maxillary central incisors and other anterior teeth follow in an ordered sequence. The mandibular lateral incisor (C) and maxillary lateral incisor (D) tend to exfoliate slightly later. Knowing the usual timing helps detect early or delayed exfoliation, which can be due to systemic factors like endocrine disorders or local factors such as crowding, supernumerary teeth, or ankylosis, guiding timely intervention.

12. (C) Shift in the midline of the dental arch

When primary teeth remain in place beyond their normal exfoliation time, they may obstruct or alter the path of erupting permanent teeth. One significant effect is a midline shift, as the permanent incisors or canines might erupt mesially or laterally to circumvent the retained primary tooth. While trauma risk (A) could occur, it is not the most common direct effect. An anterior crossbite (B) can develop but typically involves more complex

factors. Self-correction of crowding without intervention (D) is unlikely. Early detection of delayed shedding ensures appropriate orthodontic planning to maintain arch integrity.

13. (C) Lingual eruption

Lingual eruption, often called "double row" or "shark teeth," is commonly observed in lower anterior teeth, typically around 8 to 10 years old. The primary teeth persist, while permanent incisors erupt lingually. Transposition (A) involves exchanged positions of two permanent teeth, which is rare. Ectopic eruption (B) usually refers to an abnormal path that can affect maxillary first permanent molars. Early exfoliation (D) is the opposite scenario, where teeth shed prematurely. Lingual eruption can resolve spontaneously if the primary incisors are removed timely, allowing the permanent teeth to migrate into normal alignment.

14. (A) Cleidocranial dysplasia

Cleidocranial dysplasia commonly presents with multiple supernumerary teeth, delayed exfoliation of primary teeth, and delayed eruption of permanent teeth. These supernumerary teeth can block or alter the pathway of normal eruption. Amelogenesis imperfecta (B) and dentinogenesis imperfecta (C) primarily involve defects in enamel and dentin, respectively, rather than supernumerary formations. Ectodermal dysplasia (D) typically features missing or malformed teeth, not an excess. Radiographic findings that reveal multiple supernumerary teeth, especially around the maxillary anterior region, strongly suggest cleidocranial dysplasia, which also includes characteristic skeletal and clavicular abnormalities.

15. (A) Extraction of the supernumerary teeth

When supernumerary teeth impede or delay eruption of permanent teeth, prompt removal is typically indicated to allow normal eruption pathways to resume. Retaining them (B) without extraction can exacerbate crowding, create ectopic eruption, or lead to cystic changes. Initiating full orthodontic treatment (C) is premature before clearing the eruption path. Postponing intervention until 14 (D) risks further complications and more invasive treatments later. Once removed, remaining space or alignment concerns can be managed orthodontically, guiding erupting permanent teeth into favorable positions. This approach optimizes functional occlusion and aesthetic outcomes.

16. (C) Within 6 months of the eruption of the first primary tooth or by 1 year of age

The American Academy of Pediatric Dentistry and similar authorities recommend the first dental examination by the first birthday or within six months of the eruption of the initial primary tooth. Early professional evaluation is essential to establish a "dental home," provide preventive guidance, and identify any early risk factors for caries or developmental disturbances. Waiting until 3 years (A) or the first permanent tooth eruption (B) can miss critical preventive opportunities. Delaying appointments (D) until pain arises is not advisable, as it indicates an advanced problem requiring more extensive treatment.

17. (B) Anodontia

Anodontia refers to the congenital absence of all teeth, both primary and permanent. If radiographs show no evidence of developing permanent tooth buds in a child who should display tooth follicles, anodontia becomes a primary suspicion. Supernumerary teeth (A) involve extra teeth beyond the normal count. Gemination (C) occurs when a single tooth bud attempts to form two teeth. Dens in dente (D) is a tooth-within-a-tooth anomaly, usually involving maxillary lateral incisors. Confirming anodontia is critical for planning prosthetic or orthodontic interventions to ensure functional occlusion and address esthetic concerns.

18. (B) Carious lesions on the smooth surfaces of anterior primary teeth in a child under 6

Early Childhood Caries is defined by the presence of one or more decayed, missing (due to caries), or filled tooth surfaces in any primary tooth in a child under age 6. A hallmark is the involvement of smooth surfaces of maxillary anterior teeth, where liquid pools around these teeth during bottle or breast feeding. Option (A) is not typical for ECC because it involves only a single pit lesion in an older child. Option (C) is not indicative of an active ECC pattern. Option (D) excludes ECC, as it specifically mentions permanent teeth only.

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19. (A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.

ECC frequently manifests first on the maxillary anterior teeth due to prolonged contact with milk, juice, or other sugary liquids. During bottle- or breast-feeding, these liquids can pool in the vestibule around the front maxillary dentition, promoting bacterial acid production and demineralization. The mandibular anterior teeth are partially protected by the tongue and saliva flow. Thus, the assertion that ECC begins on maxillary anteriors is true, and the reason given—sugary liquid pooling—is the direct explanation for this pattern. Both statements support each other, accurately reflecting the pathological process of ECC development.

20. (C) Early weaning from the bottle and encouraging a cup by 12 months

Preventing ECC involves minimizing prolonged exposure to cariogenic fluids on the teeth, especially overnight. Using a cup by the child's first birthday is recommended to reduce pooling of sweet liquids around the maxillary anteriors. Option (A) directly contributes to ECC by allowing sugars to bathe teeth during sleep. Continuing bottle feeding until age 4 (B) further increases caries risk. Adding sugar to pacifiers (D) creates a constant source of fermentable carbohydrates for oral bacteria. The correct approach is weaning from the bottle by around 12 months, as stated in option (C).

21. (B) Bitewing radiographs of posterior teeth

Bitewing radiographs are particularly valuable in detecting interproximal lesions and early dentinal involvement in posterior teeth, often missed on visual examination in small children. An OPG (A) provides an overview of developing dentition but may lack the detail needed for early interproximal caries detection. Salivary pH testing (C) offers indirect information about risk factors but not the actual presence of carious lesions. Full mouth periapical radiographs (D) can be overly extensive and uncomfortable for a 3-year-old if no specific pathology is suspected. Bitewing films, therefore, are the standard for caries risk assessment.

22. (B) Restrict sugary snacks to mealtimes

Limiting sugar exposure to mealtimes helps reduce the frequency of acidic attacks on teeth, thereby lowering caries risk. Encouraging sweets throughout the day (A, D) significantly elevates caries potential by consistently feeding cariogenic bacteria. Unlimited fruit juices (C) also present a high sugar load, contributing to prolonged acid production. By confining sweets or sugary foods to main meals, saliva flow is enhanced, helping to buffer and wash away sugars. Pediatric dentistry guidelines strongly recommend controlling sugar frequency, reinforcing good dietary habits, and promoting tooth-friendly snack alternatives like cheese or vegetables.

23. (A) Rampant caries

Rampant caries refers to an aggressive, widespread pattern of decay affecting numerous teeth in a short period. The scenario of a 5-year-old sleeping with sweetened milk aligns with the development of multiple smooth surface lesions, indicating frequent exposure to fermentable carbohydrates. Occult caries (B) describes lesions hidden beneath apparently intact surfaces, which does not match this presentation. Arrested caries (C) indicates lesions that have halted progression. Pit and fissure caries (D) involve biting surfaces, not primarily smooth surfaces. Hence, the clinical pattern here is most accurately defined as rampant caries.

24. (B) Fluoride varnish application

In early or incipient lesions, especially white spot areas, topical fluoride varnish is an effective first-line intervention. It promotes remineralization by driving fluoride ions into demineralized enamel, potentially arresting or reversing the lesion at this early stage. Amalgam restorations (A) or stainless steel crowns (C) are more suitable for larger cavitated lesions. Extraction (D) is considered only if the tooth is irreversibly damaged or non-restorable. Since the child relies on a non-fluoridated water supply, augmenting fluoride exposure is critical. Fluoride varnish remains a widely recommended and minimally invasive treatment.

25. (C) Systemic fluoride supplements

Although topical measures like fluoride varnish or gel (B) are beneficial, the case highlights non-fluoridated community water and emergent interproximal lesions despite acceptable oral hygiene. Sealants (A) protect pits and fissures

rather than proximal surfaces. Dental extraction (D) is an overtreatment if the teeth are otherwise restorable. Systemic fluoride supplements (C) help elevate baseline fluoride levels, strengthening tooth mineralization from within and reducing susceptibility. Given the child's consistent care at home, the additional systemic fluoride is likely to confer additional protection, especially since local water analyses confirm minimal fluoride presence.

26. (C) Enhancing remineralization and reducing demineralization of enamel

Fluoride works primarily by facilitating the formation of fluorapatite, a more acid-resistant mineral, and by reducing enamel solubility in acidic conditions. Additionally, fluoride aids in remineralizing areas that have begun to demineralize, thus arresting or reversing early carious lesions. It does not form a simple mechanical barrier (A), nor does it make teeth purely inorganic (B). Replacing essential minerals with synthetic compounds (D) is inaccurate; rather, fluoride incorporates into hydroxyapatite to form a more stable lattice structure. This process balances demineralization and remineralization, culminating in less caries susceptibility.

27. (B) 0.7 ppm

Historically, the recommended fluoride concentration in community water supplies hovered between 0.7 to 1.2 parts per million (ppm), depending on average local temperatures. In 2015, the U.S. Public Health Service revised and standardized the recommendation to 0.7 ppm for all areas, reflecting changes in other fluoride sources and research on fluorosis risk. Lower concentrations (0.1 ppm) are insufficient to provide protective benefits, while higher levels (1.5 ppm or more) can increase the risk of dental fluorosis. Thus, 0.7 ppm is widely accepted as an optimal balance to prevent caries in temperate climates.

28. (C) Systemic fluoride incorporates into developing teeth, whereas topical fluoride acts externally on erupted surfaces

Systemic fluoride is ingested through water, supplements, or foods, enabling fluoride ions to integrate into developing tooth structures pre-eruption. This increases tooth resistance to acid challenges once they erupt. In contrast, topical fluoride, such as varnishes, gels, or toothpastes, interacts directly with the tooth surface, enhancing remineralization and inhibiting bacterial metabolism. Option (A) mistakenly reverses the roles, while (B) inaccurately swaps their main benefits. Although both forms ultimately contribute to caries prevention, they act at distinct stages of tooth maturation, supporting a more comprehensive dental public health strategy.

29. (C) Immediate enamel-level remineralization

Topical fluoride treatments allow direct contact with the tooth surface, facilitating rapid uptake of fluoride ions into incipient lesions and boosting enamel remineralization. This localized approach minimizes systemic fluoride ingestion and significantly reduces the risk of fluorosis, thus offering a favorable safety margin (contrary to A). With systemic supplements (B), dosage control can be challenging if a child also receives fluoride from other sources. Fluoride does not completely eradicate bacteria (D); it mainly hampers bacterial metabolism and acid production. Therefore, the key advantage of topical fluoride is its near-instant effect on enamel surfaces.

30. (D) Prescription mouth rinses with high fluoride concentration

Prescription mouth rinses with high fluoride concentration are considered topical, not systemic, forms of fluoride. They provide fluoride directly to erupted teeth instead of delivering fluoride through ingestion and incorporation into developing dentition. Children residing in non-fluoridated communities can receive systemic fluoride via supplements (A), certain fluoridated bottled water (B), or specially fluoridated milk programs (C). While mouth rinses can be beneficial in reducing caries risk, they do not function as systemic sources. Understanding this distinction is crucial for pediatric dentists prescribing or advising on fluoride regimens to optimize overall caries prevention.

31. (C) Twice-yearly professional fluoride varnish applications

Professional fluoride varnish applications are especially beneficial for children under 6, offering prolonged contact with the tooth surface. They are easy to apply, well-tolerated, and minimize

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ingestion risk. Fluoride foam (A) can be effective but is more appropriate for older children who can manage expectoration properly. High-fluoride toothpaste (B) generally targets older children or adults due to fluorosis risk if swallowed. A 0.2% fluoride mouthrinse (D) is also more suitable for older children who can reliably rinse and spit. Thus, twice-yearly varnish (C) is safest and most effective in a high-risk 3-year-old.

32. (B) It leads to anterior open bite and possibly proclined maxillary incisors

Persisting thumb-sucking beyond 4 or 5 years of age exerts anterior forces on the teeth and alveolar ridge, frequently resulting in an anterior open bite. This habit may also flare the maxillary incisors forward. Posterior crossbite (C) is more often linked to mouth breathing or pacifier use that changes cheek and tongue pressure. Normal occlusion (A) is compromised by a habit that displaces teeth. Habits that continue past preschool years (D) commonly do result in alignment issues. Early intervention to discontinue the habit helps reduce or prevent malocclusion severity.

33. (B) Thumb-sucking

Thumb-sucking is widely recognized as the most prevalent oral habit among young children. Many infants display this habit early in life as a natural self-soothing mechanism. Mouth breathing (A) often occurs secondary to nasal obstruction or other airway issues. Lip biting (C) and tongue thrusting (D) can also occur but are less frequently observed or are related to underlying skeletal or occlusal disharmonies. Persistent thumb-sucking beyond the typical developmental window can lead to anterior open bite and other malocclusion problems, emphasizing the importance of monitoring and interceptive guidance.

34. (C) Long, narrow face with high palatal vault

Chronic mouth breathing changes the balance of muscular forces in the orofacial region. The lowered tongue posture and altered orofacial muscle activity can lead to a high-arched palate and an elongated facial appearance. This is sometimes termed “adenoid facies” or “long-face syndrome.” Anterior crossbite (A) often involves a different etiology, such as skeletal discrepancies. Posterior open bite (B) is less commonly associated with mouth breathing. Persistent mouth breathing usually increases, not reduces, vertical facial dimension (D). Correcting airway obstructions early can mitigate these morphologic alterations in growing children.

35. (B) Myofunctional therapy exercises

Tongue thrusting is a functional habit that exerts forward pressure on the anterior teeth, contributing to open bite malocclusion. Myofunctional therapy exercises, which re-train tongue posture and swallowing patterns, are typically the first line of intervention. Orthognathic surgery (A) is reserved for severe skeletal discrepancies in older adolescents or adults. Full banded orthodontic treatment (C) on a 7-year-old may be premature without addressing the underlying habit. Extraction of primary teeth (D) doesn’t correct the functional component driving the open bite. Early interceptive measures focusing on habit correction can significantly improve outcomes.

36. (B) Bluegrass appliance

A Bluegrass appliance is specifically designed to deter thumb-sucking by introducing a plastic roller or bead for the tongue to rest against, diminishing the pleasure from thumb-sucking. It can be effective in helping children develop new oral habits. A fixed space maintainer (A) preserves space following premature tooth loss but does not address thumb-sucking. A rapid palatal expander (C) corrects transverse maxillary deficiencies rather than habits. A fixed anterior bite plate (D) is more commonly used for deep bites. The Bluegrass appliance remains a frequent choice for habit interception and correction.

37. (B) Tell-Show-Do with caregiver involvement

Children with mild cerebral palsy often experience motor coordination challenges but can respond well to structured, empathetic behavior management. The Tell-Show-Do technique is a foundational approach that gradually introduces dental instruments and procedures, enhancing acceptance. Active caregiver involvement aids communication, reassurance, and positioning. Pharmacological restraint (A) or immediate sedation (C) should only be considered if non-pharmacological methods are ineffective or if the child’s condition is severe. Physical

immobilization by multiple staff (D) is typically a last resort, due to potential emotional trauma. Collaboration between dental professionals and caregivers fosters a more cooperative environment.

38. (B) Single visit comprehensive care under general anesthesia

Children with congenital heart disease are at higher risk of infective endocarditis. Achieving complete dental clearance of caries in as few procedures as possible minimizes repeated bacteremia events and patient stress. Comprehensive treatment under controlled general anesthesia allows for full restoration or extraction in one session, significantly reducing repeated exposures. Multiple short visits (A) or repeated sedation (C) can elevate the risk of repeated bacteremia and heighten the child's anxiety. Postponing all treatment (D) is dangerous, risking severe infections. A single, well-planned visit under general anesthesia best balances safety and efficacy.

39. (B) A child with systemic conditions that may complicate routine dental treatment

A medically compromised child, in the context of pediatric dentistry, is one with a pre-existing health condition—cardiac anomalies, immunocompromise, endocrine disorders, or hematological issues—that could affect or be affected by routine dental procedures. Mild anxiety (A) can occur in otherwise healthy children and does not necessarily imply being medically compromised. Radiographic refusal (C) pertains to behavioral cooperation, not systemic health. If no additional modifications or precautions are required (D), the child is not medically compromised. Recognizing these systemic considerations is crucial to tailor safe and effective dental care plans.

40. (C) It reduces the risk of bacteremia leading to systemic complications

Children with specific conditions, such as congenital heart disease or immunosuppression, can be prone to severe infections. Dental procedures involving gingival manipulation may introduce bacteria into the bloodstream (bacteremia). Antibiotic prophylaxis diminishes—though does not eliminate—this bacterial influx, thereby reducing the likelihood of endocarditis or other systemic infections. Complete eradication of bacteria (A) is impossible, and there is never absolute assurance of zero risk (B). Prophylaxis is not mandatory for every child (D) but is recommended selectively based on established guidelines, emphasizing conditions with heightened susceptibility to systemic complications.

41. (B) Hemophilia

Hemophilia, a hereditary coagulation disorder, impairs the blood's ability to clot properly. Children with hemophilia often exhibit prolonged bleeding from minor trauma, including routine dental procedures that disrupt the gingiva. Juvenile rheumatoid arthritis (A) primarily affects joints rather than coagulation. Autism spectrum disorder (C) involves neurodevelopmental challenges impacting behavior and communication, but not typically bleeding risk. Cystic fibrosis (D) is a genetic condition affecting lungs and digestive system, although with no direct clotting dysfunction. Recognizing hemophilia's bleeding propensity is critical in treatment planning, including collaboration with hematologists and specialized care protocols.

42. (C) Candidal infections

Prolonged corticosteroid use can suppress the immune response, predisposing the oral cavity to opportunistic infections like candidiasis. This risk is especially pertinent when inhaled steroids for conditions such as asthma are not followed by proper rinsing of the mouth. Enlarged tongue (A) and delayed tooth eruption (B) are less commonly associated with steroid therapy. Benign migratory glossitis (D) is unrelated to immunosuppression and more of an idiopathic benign condition. Pediatric dentists must watch for signs of oral thrush or other fungal overgrowth, promptly implementing antifungal treatment or preventive measures.

43. (A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.

Uncontrolled diabetes mellitus adversely affects oral health, often manifesting as increased susceptibility to periodontal disease, including gingivitis and periodontitis. Chronic hyperglycemia diminishes the host's immune response, impairing leukocyte function, reducing collagen synthesis, and slowing tissue repair. These changes promote bacterial

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accumulation and accelerate periodontal tissue breakdown. Thus, both statements are accurate: the child's higher risk of periodontal issues (Assertion) is indeed explained by compromised immune function and healing (Reason). Managing glucose levels is therefore essential for reducing periodontal complications and supporting overall oral health in pediatric diabetic patients.

44. (B) Only for procedures that involve manipulation of gingival tissue or periapical region

Current guidelines from organizations like the American Heart Association specify prophylactic antibiotics for high-risk cardiac patients during dental procedures likely to induce gingival or mucosal bleeding, which can lead to bacteremia. Routine orthodontic treatments or bracket placements (A), lacking significant gum manipulation, typically do not require prophylaxis. It is not correct to state prophylaxis is never recommended (C) because certain conditions do warrant it. Age-based mandates (D) are not part of standard recommendations; the determining factor is the nature of the cardiac condition and the invasiveness of the dental procedure.

45. (B) Uremia due to reduced kidney function

Chronic renal disease can lead to accumulation of nitrogenous waste products in the bloodstream, known as uremia. This condition often manifests as a characteristic foul or metallic odor on the breath and an altered sense of taste. Hyperthyroidism (A) does not typically present with these oral symptoms. Overproduction of saliva (C) might contribute to drooling or other issues but not specifically metallic halitosis. Normal childhood physiological changes (D) are unrelated to severe renal complications. Recognizing uremic breath in pediatric patients alerts the dentist to potential systemic concerns requiring medical collaboration.

46. (A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.

Aggressive chemotherapy regimens often cause oral mucositis, immunosuppression, and thrombocytopenia, placing the child at heightened risk for infection, bleeding, and delayed healing. The need for special precautions, including possible antibiotic prophylaxis, atraumatic procedures, and careful scheduling around blood counts, is clear. Both the assertion—children on active cancer therapy require special management—and the reason—chemotherapy leads to mucositis and immunosuppression—are accurate, and the latter explains the former. This framework helps pediatric dentists collaborate with oncologists to ensure the safest possible environment for dental interventions during or shortly after cancer treatments.

47. (B) Removing carious lesions to prevent infection

Preventing infection is paramount in children whose medical condition can be exacerbated by additional systemic stress. Seizure medications may also affect salivary flow or oral hygiene practices, potentially increasing caries risk. Early removal or restoration of carious lesions (B) is critical to avert pain, abscess, or other complications that might trigger seizures due to stress. Cosmetic procedures (C) and orthodontic alignments (A, D) are typically elective and secondary when compared with the priority of infection control. Eliminating infection sources helps maintain stable overall health in a child with epilepsy.

48. (B) Pulp chambers in primary teeth are larger relative to crown size

Pediatric restorative therapy must consider that primary teeth possess proportionally larger pulp chambers, thinner enamel, and less tooth structure to work with, demanding conservative cavity preparation and care to avoid pulp exposure. While enamel (A) is actually thinner in children's teeth, wear patterns (C) can be quite pronounced in pediatric patients due to diet and bruxism. Statement (D) disregards the unique anatomy and physiology of primary teeth. Understanding the relative pulp chamber size is critical in preventing iatrogenic pulp damage and selecting materials that respect the shorter expected life span of primary teeth.

49. (B) Restoration of extensively carious primary molars

Stainless steel crowns (SSCs) are frequently used to restore primary molars that have large carious lesions or have undergone pulpotomies/pulpectomies. They provide full coverage, durability, and protection of the tooth until exfoliation. Option (A) is incorrect because SSCs are not typically utilized for anterior

permanent teeth; they are not esthetic. Temporary coverage of fractured permanent incisors (C) often involves other methods. They also are not used primarily as space maintainers (D). SSCs remain a reliable choice for pediatric restorative needs when inadequate structure remains to support conventional fillings in primary molars.

50. (D) Stainless steel crown

A pulpotomy in a primary molar involves removing the coronal pulp while preserving the radicular pulp's health. Due to the substantial tooth structure loss and the need to protect remaining tooth integrity, a stainless steel crown (SSC) is typically placed. SSCs offer full coverage, preventing microleakage and fracturing of the weakened tooth. Glass ionomer or amalgam fillings (A, B) do not envelop the entire tooth and can fail if marginal integrity is compromised. Composite resin (C) may lack durability for posterior stress areas in pediatric teeth. SSCs provide a robust solution until natural exfoliation.

51. (B) A universal, predictable skill or ability acquired by children at a specific age range

Developmental milestones describe key achievements or competencies—like walking, talking, or certain psychosocial skills—that the majority of children master within a recognized age bracket. They reflect typical neurological and physical growth patterns, influenced by genetic and environmental factors. Option (A) is inaccurate since milestones are not merely incidental but rather consistent landmarks. (C) overlooks the powerful role of environment, such as nutrition and stimulation, in skill acquisition. (D) is incorrect because developmental timelines are fairly predictable. Understanding these milestones helps pediatric dentists relate a child's chronological age to their physical and psychological readiness for treatment.

52. (C) 16–18 months

Primary maxillary canines characteristically emerge around 16 to 18 months of age, though individual variation exists. Most children finish erupting anterior primary teeth between one and two years of age. Options (A) and (B) are too early for canine eruption, which typically follows primary incisors. (D) can be slightly late for canines, as by 19–20 months, many children have them well in place. Accurate knowledge of eruption timing enables early detection of abnormalities, ensuring timely interventions if malposition, delayed eruption, or early childhood caries arises.

53. (B) Primary teeth maintain space for permanent successors and aid in normal chewing and speech

Primary teeth are integral in guiding proper jaw and arch growth, helping children develop correct speech articulation and chew effectively. They also preserve space for permanent teeth, preventing drifting that may otherwise result in crowding or misalignment. Option (A) is false; the position and integrity of primary teeth influence alveolar bone development, swallowing patterns, and vocalization. (C) underestimates the functional importance of deciduous dentition. (D) is incorrect because exfoliation and replacement by permanent teeth occur sooner than 16, typically around 6 to 12 years of age. Recognizing their significance underpins comprehensive pediatric oral care.

54. (D) Significantly longer clinical crown than root

Primary teeth have certain distinguishing features such as a narrower occlusal table, thinner enamel and dentin layers, and relatively larger pulp chambers. These attributes make them more prone to caries progression and accidental pulp exposures during restorative procedures. The statement that they possess a "significantly longer clinical crown than root" is incorrect because, in reality, primary teeth generally have shorter clinical crowns and relatively more flared, slender roots. This helps accommodate developing permanent tooth buds. This unique anatomy underscores the need for careful technique during pediatric restorative or pulp treatments.

55. (B) ECC often begins on maxillary anterior teeth; rampant caries can involve multiple teeth in various arches

ECC typically manifests on the maxillary anterior teeth, often because sugary liquids pool around these surfaces, especially if a child sleeps with a bottle or breastfeeds frequently without proper oral care. Rampant caries in older children can be more widely spread, including anterior and

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posterior teeth, and is often linked to multiple risk factors like diet, inadequate oral hygiene, and lower fluoride exposure. Option (A) is incorrect because ECC frequently targets anterior maxillary teeth, not posterior teeth exclusively. (C) and (D) are oversimplifications; both ECC and rampant caries can have multifactorial etiologies and can progress to posterior teeth.

56. (A) Periodic professional fluoride applications and parental education on oral hygiene

The foundational strategy for caries prevention in preschool children includes regular fluoride exposure (via varnishes or other topical methods) and robust parental education on limiting sugary snacks, encouraging proper brushing techniques, and scheduling routine dental checkups. Option (B) neglects that early years are crucial for establishing habits. (C) is incorrect and potentially harmful, as antibiotics are not a standard method for caries prevention. (D) is also inappropriate; the first dental visit should typically occur by age 1 or within six months of the first tooth's eruption for optimal prevention.

57. (B) Eliminate supplemental fluoride while continuing regular brushing with a pea-sized amount of fluoride toothpaste

Excessive fluoride intake during tooth development can lead to fluorosis, typically seen as white or opaque areas on enamel. Removing supplemental fluoride is the best step if the child already resides in a fluoridated region, as cumulative ingestion can exceed recommended levels. Nonetheless, routine brushing with a properly measured fluoride toothpaste remains crucial for caries prevention, ensuring only a small amount is swallowed. Stopping all fluoride exposure (A) can increase caries risk, while raising supplements (C) would worsen fluorosis. Relying solely on non-fluoridated water (D) ignores the proven protective effect of controlled topical fluoride.

58. (B) Discontinuing nighttime feeding and introducing water rinses

Early Childhood Caries often develops when a child's teeth are exposed to sugars for prolonged periods, particularly overnight. The first critical step is modifying feeding practices—ideally, ending or reducing night feeds that bathe teeth in milk or sweet liquids. Then, offering plain water or gentle rinsing (if the child cooperates) helps wash away residual sugars. Option (A) is invasive and premature for non-cavitated lesions. Pulpectomy (C) is indicated only if the pulp is compromised. Adult-strength fluoride mouthrinse (D) poses a risk of ingestion for a 2-year-old. Behavior and dietary changes are fundamental preventive measures.

59. (A) Fluoride partially replaces hydroxyl ions in hydroxyapatite, forming fluorapatite

A vital protective feature of fluoride is its ability to substitute hydroxyl ions in hydroxyapatite crystals to form more acid-resistant fluorapatite. This chemical transformation lowers the critical pH at which enamel dissolves, thereby decreasing solubility under acidic conditions. Option (B) is incorrect; fluoride does not dissolve the organic parts of teeth. Option (C) mistakenly claims that fluoride lowers salivary pH, whereas adequate salivary pH is beneficial for remineralization. While fluoride does inhibit bacterial metabolism (D), its role in altering the tooth mineral is a significant factor in preventing demineralization, making (A) the key action.

60. (C) Rinse thoroughly with water immediately after applying the varnish

Fluoride varnish sets quickly on contact with saliva, and immediate rinsing post-application diminishes its beneficial contact time. Protocol typically includes thorough drying of tooth surfaces (A) to maximize retention, and a thin but complete coverage of varnish (B). Parents and child are instructed to avoid brushing that day (D), letting the varnish remain in place for several hours for optimal fluoride uptake. Rinsing (C) immediately after application is incorrect as it disrupts the varnish's adherence, preventing the intended prolonged fluoride release onto enamel.

61. (B) Excess sugar consumption offsetting the protective fluoride effect

Even with optimal community water fluoridation at about 0.7 ppm, a diet rich in sugary foods or frequent sugary beverages can overwhelm fluoride's cariostatic effects. This results in an acidic oral environment, sustaining bacterial growth

and enamel demineralization. Overexposure to fluoride (A) would more likely present as fluorosis rather than caries. While some children may need additional fluoride sources, labeling the public water supply's fluoride level (C) as insufficient is incorrect if it meets recognized guidelines. There is no concept of "complete immunity" to fluoride benefits (D). Consequently, limiting sugar is crucial.

62. (A) Constriction of the maxillary arch and development of an anterior open bite

Persistent thumb-sucking exerts forward and upward pressure on the maxillary anterior teeth and alveolar ridge, while cheeks contract inward in response. This action can produce a narrow maxillary arch, leading to posterior crossbite and/or an anterior open bite due to the vertical intrusion of front teeth. Options (B) and (D) are not typical outcomes of this habit. Dismissing it as having no effect (C) ignores well-documented orthodontic consequences. Early intervention—behavioral or with habit-breaking appliances—often prevents or mitigates alveolar form changes, reducing the severity of malocclusions that may require future orthodontic treatment.

63. (B) Positive reinforcement and habit awareness

Behavioral approaches are fundamental for managing mild oral habits in children. Positive reinforcement, such as sticker charts or small rewards, can motivate the child to consciously reduce nail-biting episodes. Awareness techniques might include gentle reminders or covering nails with a bitter-tasting deterrent. Immediate full orthodontic intervention (A) for incisor chipping is excessive, and extracting chipped teeth (C) is unwarranted if they are restorable. Sedation (D) addresses fear or uncooperative behavior during treatment, not a habitual behavior. Hence, the initial, least-invasive management starts with habit awareness and a reward-based system.

64. (D) Prolonged pacifier or digit-sucking malocclusion

Long-standing use of pacifiers or thumb-sucking can reshape alveolar arches and lead to anterior open bites. The described partial collapse of the anterior palate, often narrowing or flattening of the maxillary arch, is typical. Mouth breathing (A) might produce a long-face syndrome or high palatal vault, but not necessarily an open bite from anterior alveolar collapse. Tongue tie (B) usually impacts speech and feeding, not alveolar morphology in this manner. An anterior crossbite (C) is a different malocclusion pattern involving reverse labiolingual relationships, not indicated by these clinical findings.

65. (C) ENT (Ear, Nose, Throat) referral for possible adenoidectomy

When mouth-breathing is traced to a primary airway obstruction, such as enlarged adenoids, an interdisciplinary approach is crucial. An ENT specialist can assess nasal patency and potentially perform an adenoidectomy to restore normal nasal airflow. This can prevent the orofacial changes associated with chronic mouth breathing. Orthodontic expansion (A) alone will not correct airway problems originating from adenoid hypertrophy. Extracting primary canines (B) or using an appliance (D) addresses malocclusion or habits, not anatomic airway obstruction. Therefore, the first priority is addressing the root cause via referral to ENT.

66. (C) 4 years

Most children naturally stop thumb-sucking and pacifier use by ages 2 to 4. If the habit persists beyond age 4, dental or skeletal changes may occur, such as anterior open bite or maxillary constriction. Intervening around this age can help avoid more extensive orthodontic corrections later. Evaluating at age 1 (A) is too early because the habit is frequently normal at that stage. Waiting until 10 (D) is far too late. Three years (B) is somewhat early for strict intervention, but by age 4, persistent habits often warrant professional guidance.

67. (B) Coagulation disorder (e.g., Hemophilia)

Prolonged or excessive bleeding following a routine dental extraction is a classic red flag for a possible bleeding disorder. Hemophilia is among the more common hereditary coagulopathies that could present with such a symptom. Asthma (A) primarily affects respiratory function, not clotting. Autism (C) and ADHD (D) are neurodevelopmental conditions. Though they may necessitate specific behavioral management, they don't inherently cause abnormal bleeding. A thorough medical history, including potential family history of bleeding

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disorders, is essential for early identification and the implementation of appropriate bleeding control measures in pediatric dental care.

68. (C) Delayed wound healing and gingival inflammation

Uncontrolled Type 1 diabetes leads to microvascular changes and a compromised immune response, so children with poor glycemic control often present with delayed healing, increased gingival inflammation, and a heightened susceptibility to periodontal problems. Excessive calculus formation (A) isn't a hallmark sign, though plaque accumulation can occur if oral hygiene is suboptimal. Lowered caries risk (B) is contrary to reality; some diabetic diets can still be high in fermentable carbohydrates or the child may have less frequent, less thorough brushing. Permanent tooth ankylosis (D) is unrelated to the diabetic condition.

69. (A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.

Congestive heart failure can limit effective circulation, impairing the distribution of nutrients and immune factors to oral tissues. This reduced perfusion supports bacterial growth and complicates tissue healing, elevating the risk of oral infections or periodontal disease. Thus, the assertion that these children face higher dental complications is correct. The reason—that reduced cardiac output compromises oral tissue vascularity and immune function—explains why these children are more prone to such complications. Integrating medical and dental management is vital to minimize infection risk and ensure safe treatments, reflecting how cardiovascular status influences oral health outcomes.

70. (B) Consult hematologist about factor replacement or prophylaxis before treatment

In children with hemophilia, even minor dental procedures risk excessive bleeding. Collaboration with a hematologist helps determine the need for factor VIII or IX replacements and timing to ensure clotting factors are adequate when invasive care is rendered. Simply proceeding without special considerations (A) could be dangerous. Avoiding local anesthesia (C) is impractical and detrimental to pain management. Delaying treatment until the permanent dentition (D) ignores the child's current infection risk or potential for more significant complications. Proactive coordination of care ensures safe and effective management of pulp therapy for hemophiliac patients.

71. (B) Obliteration of pulp chambers and canals

Dentinogenesis imperfecta, a hereditary dentin defect, often presents radiographically as "shell teeth" with obliterated pulp chambers and canals due to excessive dentin deposition. The crowns typically show bulbous outlines with cervical constriction. Radiolucent areas in the pulp (A) suggest pathology like pulp stones or necrosis. Large pulp chambers with thin enamel (C) might be consistent with other conditions, such as hypoplastic enamel or amelogenesis imperfecta. While some features can be subtle, complete normalcy on radiographs (D) is rare in dentinogenesis imperfecta. Early detection helps manage potential enamel fractures and rapid wear.

72. (B) Wipe teeth or rinse after each dose

Sweetened antibiotics can increase cariogenic challenges by contributing to frequent sugar exposures. Completely discontinuing needed medication (A) is clinically inappropriate. While higher antibiotic doses (C) wouldn't address plaque formation, stopping brushing (D) further promotes plaque accumulation. The best approach is to gently clean the child's mouth—by wiping the teeth with gauze or having the child rinse with water—immediately after each dose. This measure diminishes residual sugar that oral bacteria metabolize into acids. Counseling parents on oral hygiene after medication use is a key part of comprehensive caries prevention in pediatric dentistry.

73. (C) General anesthesia

When young children present with extensive treatment needs, high anxiety, and an inability to cooperate, general anesthesia can be a safe and effective option. It facilitates comprehensive care in one session while minimizing psychological trauma. Minimal sedation (A) or nitrous oxide (D) may help cooperative children with mild apprehension, but might be insufficient for those who are extremely

anxious or uncooperative. Voice control (B) alone typically applies to children capable of partial compliance. By opting for general anesthesia, the dentist can perform necessary restorations or extractions thoroughly with minimal emotional distress to the child.

74. (A) Have the child gargle or rinse after each inhaler use

Prolonged steroid inhaler use can predispose pediatric patients to oral candidiasis and dryness, both increasing caries risk. Instructing the child to rinse thoroughly after each inhalation helps clear residual corticosteroids from the oral cavity, lessening the risk of fungal growth. High-dose fluoride mouthwash (B) may have benefits for caries prevention but does not specifically address fungal risk. Avoiding local anesthesia (C) has no rationale in asthma management and may compromise pain control. Skipping rubber dam usage (D) decreases procedural efficiency and infection control. Proper rinsing is the primary, evidence-based preventive strategy.

75. (B) Short, behavior-focused appointments using Tell-Show-Do and frequent breaks

Children with Down syndrome often benefit from a slow, gradual introduction to procedures. Short appointments, employing the Tell-Show-Do technique, and scheduling frequent breaks accommodate limited attention spans and reduce anxiety. Parental involvement in consistent oral hygiene training at home also matters. Forced restraint (A) can be traumatic and is not the recommended first approach unless other methods fail. Comprehensive general anesthesia (C) may be reserved for extensive or urgent treatment if less invasive management proves unworkable. Antibiotic prophylaxis for simple gingivitis (D) is not standard. Emphasizing incremental desensitization and supportive communication fosters better acceptance and compliance.

76. (B) Pulpotomy

A pulpotomy, a common pediatric endodontic procedure, involves excising the coronal pulp that has been compromised by caries or trauma, while preserving the vitality of the radicular pulp. A medicament (e.g., formocresol or mineral trioxide aggregate) is then placed over the remaining pulp stumps. Pulpectomy (A) goes further, removing the entire pulp from coronal and root canals, typically when the radicular pulp is also nonvital or infected. Apexification (C) and apexogenesis (D) are endodontic procedures used mostly in immature permanent teeth to encourage apical closure or maintain pulp vitality for root development, not typically for primary teeth.

77. (A) Mineral trioxide aggregate (MTA) or Formocresol

Traditional pulpotomy techniques often employ formocresol due to its fixative properties, although concern about formaldehyde content has led to the increasing use of biocompatible alternatives such as MTA. Glass ionomer sealants (B) or composite resins (C) are generally used for coronal restorations, not as pulpal medicaments. Gutta-percha (D) is the standard root canal filling material for permanent teeth, not typically for partial pulp treatments in primary teeth (though certain modified approaches exist). Hence, MTA or formocresol remain the primary choices to manage coronal pulp tissue in pediatric dentistry pulpotomy procedures.

78. (C) Stainless steel crowns offer full coronal coverage and better longevity

After pulpotomy, the tooth crown may be weakened because a substantial portion of structure has been removed or compromised. Stainless steel crowns provide full-coverage protection, preventing microleakage, fractures, and recurrent decay around compromised margins. They are also relatively simple to place, cost-effective, and durable for the remaining life of the primary tooth. Composite restorations, although esthetic, may not adequately reinforce severely weakened tooth walls. Option (A) is incorrect; stainless steel crowns are more durable. Composites do not "expand" tooth structure (B) nor do they inherently cause pulp necrosis (D). Crown coverage thus ensures a better long-term outcome.

79. (D) Minimal coronal pulp exposure with vital radicular tissue

Pulpectomy, or complete pulp removal, is generally indicated when infection extends beyond the coronal pulp into radicular canals, or when the radicular pulp is necrotic. Irreversible pulpitis (A) or necrotic pulp

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(B) in a restorable tooth (C) supports pulpectomy. However, minimal coronal pulp exposure with healthy radicular pulp (D) is typically managed by a pulpotomy or protective pulp therapy. In such cases, complete removal of radicular pulp is unnecessary. Recognizing the difference between a viable coronal pulp exposure and a fully compromised pulp is crucial for selecting the appropriate endodontic treatment for primary teeth.

80. (B) Pulpotomy addresses only coronal pulp; pulpectomy removes coronal and radicular pulp

Pulpotomy entails removing the inflamed coronal pulp while preserving vital, healthy radicular pulp. A medicament is placed to maintain root pulp vitality. Pulpectomy involves removing the entire pulp from the coronal chamber and the root canals, then obturating them with a resorbable filling material in primary teeth. Option (A) is reversed, stating the opposite. (C) is incorrect since pulpectomy is often done when the pulp is necrotic or irreversibly inflamed. (D) incorrectly suggests both remove the entire pulp. Understanding these distinctions is crucial in deciding the appropriate treatment based on pulpal status.

81. (C) Pulpotomy followed by stainless steel crown

A large carious lesion approximating the pulp in a primary tooth—without evidence of radicular pathology—often calls for a pulpotomy if the coronal pulp is compromised but the radicular pulp is still vital. This approach removes only the diseased coronal pulp, places a suitable medicament, and completes coverage with a stainless steel crown to ensure structural integrity. Simple extraction (A) should be a last resort if the tooth is not restorable or infection is severe. Direct pulp capping (B) is less predictable if significant pulp involvement is suspected. Pulpectomy (D) is reserved for cases where radicular pulp is necrotic.

82. (C) Pulpectomy and placement of a resorbable filling, followed by a crown

When the radicular pulp is affected—manifesting as necrosis or infection extending beyond the coronal pulp—pulpectomy becomes the recommended approach. In such a scenario, fully debriding and disinfecting the canals, then obturating them with a resorbable material (commonly zinc oxide eugenol or an alternative pediatric paste) preserves the tooth's function until natural exfoliation. Extraction (A) may be premature, compromising arch length. A simple restoration (B) fails to address the infected pulp. Vital pulpotomy (D) is inappropriate if the radicular pulp is not healthy. Final restoration typically involves a stainless steel crown for durability.

83. (C) Complete coverage with a stainless steel crown

Full coronal coverage with a stainless steel crown is recommended once root canal therapy (pulpectomy) is performed in a primary molar. This approach guards against fracture, protects the root canal filling, and prevents microleakage. A temporary filling (A) is insufficient for the tooth's functional demands and would require frequent replacement. Opting out of a definitive restoration (B) exposes the tooth to reinfection. Extraction (D) nullifies the purpose of preserving a restorable tooth. Durable coverage ensures the tooth remains in place until natural exfoliation, maintaining arch integrity and proper occlusal function.

84. (A) Presence or absence of radicular pathology

The main determinant in selecting pulpotomy versus pulpectomy is whether the pulp infection has extended into the radicular tissues. If the radicular pulp remains healthy and vital, a pulpotomy might suffice, removing only the diseased coronal pulp. Conversely, signs of root pathology (e.g., necrosis, periapical lesions) indicate the need for a pulpectomy. The size of the carious lesion (B) alone does not dictate treatment. Similarly, although stainless steel crowns (C) often follow these procedures, their availability is not the key determining factor. Esthetic considerations (D) are secondary to clinical pathology.

85. (C) Use a permanent root canal filling material like gutta-percha

In primary teeth, pulpectomy requires removal of necrotic pulp from both the coronal chamber and root canals, followed by irrigation with antimicrobial solutions. Since the tooth eventually exfoliates, a resorbable filling (like iodoform-based paste or zinc oxide eugenol) is placed to accommodate physiologic root resorption. Gutta-percha (C) is a non-resorbable material used primarily in

permanent teeth, making it unsuitable for primary tooth pulpectomy. The final step is usually a coronal restoration with a stainless steel crown. Gutta-percha could impede normal root resorption and exfoliation, thus it is not recommended.

86. (C) Primary mandibular first molar

Primary mandibular first molars often present with unique, intricate occlusal anatomy that predisposes them to caries. They have narrow occlusal tables and thin enamel, making rapid progression to the pulp more likely. Anterior primary teeth (A, B, D) can develop pulp pathology, but less frequently require endodontic interventions than posterior molars, unless there's a severe habit or traumatic injury. Primary maxillary canines are typically not as prone to extensive occlusal decay. In practice, many pediatric pulpotomies or pulpectomies address issues in the primary molars, particularly the first molars on both arches.

87. (B) May lead to space loss and malalignment of the permanent successor

Neglected carious primary molars can lead to premature exfoliation or extraction, which in turn results in loss of arch space. The adjacent teeth may drift or tilt, narrowing the space for the erupting permanent successor, causing misalignment or crowding. Early eruption (C) is not a typical direct outcome of untreated caries, while complete ankylosis of the permanent germ (D) is rare and usually related to trauma or infection that affects the periodontal ligament area. Claiming no effect (A) is incorrect because healthy primary molars guide correct alignment for their successors.

88. (B) Loss of arch length

Severe caries in a primary second molar that remains untreated may necessitate extraction if the tooth becomes non-restorable. Premature loss of a primary second molar often leads to drifting of adjacent teeth and subsequent loss of arch length. As a result, the erupting permanent tooth may become crowded or impacted. Superficial discoloration (A) and minor gingival inflammation (D) understate the severity of an abscess, which can lead to more significant infection. Cosmetic changes (C) are secondary in a tooth nearing exfoliation anyway. Maintaining arch length via restorative care or space maintenance is paramount.

89. (C) Furcation involvement typical of radicular pathology in primary molar

Primary molars have their root trunks dividing sooner into separate roots, making the furcation region relatively close to the pulp chamber. Caries or infection can quickly spread into the furcation area, seen radiographically as a radiolucent lesion. Reversible pulpitis (A) doesn't usually produce a distinct radiolucency in the furcation. Internal resorption (B) appears as radiographic enlargement of the pulp canal, not specifically the furcation. Enamel hypocalcification (D) is a superficial enamel defect, not typically creating radiolucent furcation changes. Thus, involvement of the furcation area indicates likely radicular infection or pathologic changes.

90. (C) Pulpectomy with resorbable filling

A chronic abscess typically indicates a necrotic pulp in both the crown and root. If the tooth is restorable and there is enough supporting bone, performing a pulpectomy (complete pulp removal) is preferred, followed by obturation with a resorbable filling material, such as zinc oxide eugenol paste. This preserves the tooth to maintain arch space. Extraction (A) sacrifices that space and can lead to orthodontic issues. Direct pulp capping (B) applies only to small, vital pulp exposures. Pulpotomy (D) targets vital radicular pulp with no infection; necrotic cases demand full pulp extirpation.

91. (A) Every 6–12 months

High caries-risk children benefit from frequent monitoring due to their elevated likelihood of developing new lesions or progression of existing ones. Guidelines typically suggest bitewing radiographs at intervals of six to twelve months if interproximal surfaces can't be clinically visualized. This schedule (A) balances the need for early detection with minimizing radiation. Waiting 2–3 years (B) can miss caries progression. Restricting radiographs until symptomatic (C) risks extensive damage. Complete avoidance (D) hinders timely diagnosis. Adhering to these intervals ensures early intervention for a child with heightened caries vulnerability.

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92. (B) Ectodermal dysplasia

Ectodermal dysplasia involves malformations of structures arising from the ectoderm, including hair, sweat glands, and teeth. Children may have hypohidrosis (decreased sweating), leading to heat intolerance, and show abnormal tooth development—missing or malformed primary and permanent teeth. Smooth-surface caries could be partly due to altered tooth shape or enamel. Cleidocranial dysplasia (A) is more associated with multiple supernumerary teeth and delayed eruption. Amelogenesis imperfecta (C) primarily affects enamel formation rather than sweat glands. Hypothyroidism (D) can delay tooth eruption and growth but typically doesn't cause abnormal sweating patterns or severe heat intolerance.

93. (C) Dry anterior gingiva and open lip posture

Chronic mouth breathers often present with an open-lip posture because nasal airflow is compromised. The constant passage of air over the gingiva leads to dryness and can contribute to inflammation or gingivitis in anterior areas. Lips sealed at rest (A) is the opposite of mouth breathing. A hyperactive gag reflex (B) has various etiologies but is not a primary mouth breathing feature. Excessive lateral tongue thrust (D) may manifest with other habits or orofacial muscular imbalances, rather than standard mouth breathing alone. Recognizing mouth breathing's hallmark signs is key to intervention.

94. (D) Assertion is false, but Reason is true.

Studies indicate that fluoride varnish can be more convenient and effective than gels, especially in young children, because varnish adheres to tooth surfaces longer, allowing a sustained release of fluoride. Thus, the assertion that fluoride gels are "always superior" is incorrect. Varnishes are widely recommended for children due to their ease of application and reduced ingestion risk. The reason—that varnish's prolonged adherence enhances enamel fluoride uptake—is valid. It explains why many pediatric dentists favor varnish over gels for a more controlled and enduring caries-preventive effect, especially in noncooperative or very young children.

95. (B) Terminate procedure and support the airway

In a sedated pediatric patient displaying respiratory depression, the immediate priority is airway management. Halting the dental procedure, ensuring the airway is patent, and supporting breathing with supplemental oxygen or other maneuvers is critical. Increasing the sedation dose (A) would worsen the problem. Rushing to complete treatment (C) endangers the child's safety, while giving a sweet drink (D) addresses hypoglycemia, not respiratory depression. Pediatric sedation guidelines stress vigilant monitoring of vital signs, readiness to rescue from deeper sedation, and ensuring staff and equipment are prepared to manage airway compromise promptly.

96. (C) Echocardiogram report

An echocardiogram provides vital structural and functional details about a child's heart status. Understanding residual defects or compromised cardiac function helps the dentist evaluate the need for antibiotic prophylaxis, sedation considerations, and potential appointment modifications. While a complete blood count (A) or prothrombin time (B) may be important if there are concerns about bleeding or anemia, neither offers the direct insight into cardiac anomalies or function that an echo does. A pulmonary function test (D) applies more to respiratory conditions. Hence, an updated echocardiogram report is key to safe planning for invasive dental procedures.

97. (B) Sedation or general anesthesia in a controlled environment

Children on the severe end of the autism spectrum often struggle with sensory sensitivities and communication challenges, making conventional behavior management strategies insufficient for urgent procedures. Utilizing sedation or general anesthesia ensures safe, humane delivery of care, limiting distress and risk of physical harm. Simply restraining the child (A) without sedation can be traumatizing. Repeated instructions or attempts to force compliance (C) are typically futile and heighten anxiety. Delaying or dismissing treatment (D) risks exacerbating pain or infection. Therefore, sedation or general anesthesia in a setting that accommodates special needs is most appropriate.

98. (C) Structured "tell-show-do" with short, well-planned visits

Children with ADHD benefit from predictability, concise instructions, and frequent breaks. A structured "tell-show-do" approach is effective when it breaks procedures into smaller tasks and uses consistent reinforcement. Short visits prevent fatigue, limit hyperactive behavior, and keep focus on immediate tasks. Sedation alone (A) might help but does not address the fundamental need for structured communication and short appointments. Long, drawn-out sessions (B) can worsen attention lapses. Physical restraint (D) is a last resort and should generally be avoided unless absolutely necessary for safety. Thus, carefully planned, shorter appointments enhance cooperation and compliance.

99. (A) Schedule multiple brief appointments with seizure precautions

In a child with poorly controlled epilepsy, shorter appointments reduce stress and minimize the window for seizure triggers. Collaboration with the child's physician to optimize medication schedules and employing seizure precautions—such as having oxygen and suction ready—are crucial. Avoiding local anesthesia (B) is inhumane and unnecessary. Sedation without medical consultation (C) risks exacerbating seizure frequency or interactions with anticonvulsants. Postponing all treatment until adolescence (D) will likely lead to deterioration of oral health and possible abscesses or pain crises. Well-coordinated, controlled, and cautious appointment strategies ensure safety and maintain optimum dental care.

100. (B) General anesthesia in a hospital setting, completing restorations/extractions

Severe asthmatic children can decompensate easily under the stress of repeated, lengthy dental appointments. Office-based sedation might be risky if the child experiences bronchospasm or an acute attack. Providing comprehensive treatment under controlled general anesthesia in a hospital setting offers precise airway management and immediate medical support if complications arise. Attempting partial treatment without anesthesia (C) or sedation can cause significant distress, potentially triggering respiratory events. Prophylactic antibiotics (D) do nothing to resolve active caries or prevent progression. A single, well-planned general anesthesia session ensures complete dental rehabilitation and minimizes repeated stressors.

101. (C) Providing proactive counseling and instructions to parents about future oral health needs

Anticipatory guidance is a preventive concept, where dentists educate parents and caregivers about upcoming developmental stages and associated oral risks before they manifest. The idea is to empower them with knowledge about teething, dietary choices, fluoride usage, and hygiene practices that align with each child's changing needs. This proactive approach promotes healthier habits and reduces the likelihood of serious dental problems later. Option (A) confuses anticipatory guidance with consent forms. (B) and (D) disregard its broad preventive application. By embracing anticipatory guidance, pediatric dentists help families stay a step ahead in maintaining children's oral health.

102. (B) Mandibular condyle

Facial growth in early childhood is significantly influenced by the growth of the mandible at the condylar region. This area, rich in cartilaginous tissue, expands through endochondral ossification, propelling the mandible downward and forward. Although the maxillary tuberosity (A) contributes to posterior maxillary extension, the principal driver of facial lengthening is the mandibular condyle. The coronoid process (C) provides muscle attachment but isn't the primary site of longitudinal growth. The TMJ disk (D) permits movement rather than stimulating bone growth. Recognizing the condyle's role is crucial for understanding mandibular growth patterns in pediatric patients.

103. (B) It helps predict space availability and identify disturbances that might need intervention

Knowledge of normal eruption timelines allows the pediatric dentist to detect delayed or premature eruption, supernumerary teeth, ankylosis, or other anomalies that could compromise arch form and tooth alignment. Early detection can guide space management, orthodontic referrals, and interceptive treatments to maintain functional occlusion and facial aesthetics. Immediately surgically exposing delayed primary teeth (A) is not standard practice. Eruption timing directly affects long-term occlusion (C), contradicting that statement. While eruption data can be one indicator of a child's growth stage, it's not solely for chronological age calculation

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(D) but for broader diagnostic and preventative measures.

104. (D) Maintaining space for a necrotic tooth that remains in place but is restorable

Space maintainers are generally placed when a primary tooth is lost prematurely, ensuring adjacent teeth don't drift and compromise the space for its permanent successor. Indications include early loss (A) and congenital absence (B), as well as significantly delayed eruption (C). However, placing a space maintainer around a necrotic yet still-present tooth (D) is unnecessary if the tooth itself can be treated (e.g., pulpectomy) and restored to serve as a natural space maintainer. If the necrotic tooth is not restorable, extraction followed by space maintenance could be considered. Simply preserving a restorable tooth negates the need.

105. (C) A fixed maintainer is cemented, requiring less daily cooperation, while a removable one relies on patient compliance

Fixed space maintainers, such as band-and-loop or lingual arch appliances, are cemented onto the teeth. This design eliminates the need for children to remember to wear or properly insert an appliance, thus reducing reliance on patient compliance. In contrast, removable space maintainers can be taken out and reinserted, making them highly dependent on cooperative behavior. Option (A) is reversed; removable maintainers demand consistent patient efforts. Region-based distinctions (B) are overly simplistic; posterior or anterior usage depends on which tooth is lost. There is no absolute contraindication (D) for removable maintainers in children under 10.

106. (C) Distal shoe

When a primary second molar is lost before eruption of the permanent first molar, the distal shoe appliance is preferred. It features a subgingival extension that guides the emerging first molar into correct alignment, preventing mesial drift of adjacent teeth. A band and loop (A) typically anchors onto an adjacent tooth but does not control the vertical eruption path of a non-erupted permanent tooth. Nance appliances (B) and lower lingual holding arches (D) often require permanent first molars or erupted lower incisors for anchorage. The distal shoe is specifically designed for this scenario to preserve space and ensure proper tooth eruption.

107. (B) Band and loop

In this scenario, the permanent maxillary first molar has erupted fully, providing a stable anchor. A band can be cemented around it, with a loop extending to maintain the space created by the lost primary first molar. Distal shoe (A) is only indicated when the permanent molar has not yet erupted. A removable partial denture (C) is generally less preferred for single tooth space maintenance in a cooperative child, as it relies on daily compliance. A transpalatal arch (D) might be used in bilateral cases or for stabilizing arch width, but a band and loop is simpler for a single gap.

108. (B) Place a lower lingual holding arch to stabilize anterior tooth position

When primary canines are lost prematurely in the mandible, the lower anterior region can collapse or crowd. A lower lingual holding arch is often placed to maintain arch circumference and minimize further mesial drift of posterior teeth. Simply doing nothing (A) risks increased crowding. Extracting permanent incisors (C) would be extremely aggressive and inappropriate. Distal shoe appliances (D) are for guiding unerupted molars, not stabilizing incisor position. By placing a holding arch, the clinician secures the remaining space, potentially preserving the integrity of the lower arch form and aiding future orthodontic management.

109. (B) An acrylic button resting on the palate

The Nance appliance features an acrylic button that rests against the anterior palate, providing an anterior anchor and preventing mesial drift of posterior teeth. The transpalatal arch, by comparison, is a wire connecting the two maxillary molars across the palate without a palatal acrylic button. Option (A) is incorrect because both appliances typically involve bands on molars. (C) describes a distal shoe's function. Speech interference (D) can occur with any palatal appliance, but it is not the defining difference between a Nance and a transpalatal arch. The palatal acrylic button is the unique hallmark of the Nance.

110. (C) Placing the metal extension just coronal to the marginal gingiva

A distal shoe space maintainer must have its metal guide extending subgingivally, contacting the mesial surface of the unerupted permanent first molar to guide it into position. Placing the extension coronal to the marginal gingiva (C) defeats its entire purpose because it cannot guide the erupting molar effectively. Accurate impressions (A) are vital for proper appliance fit. Measuring or radiographically determining (B) where the permanent molar will erupt ensures the metal extension is positioned precisely. Periodic monitoring (D) is mandatory to confirm correct adaptation and adjust for eruptive changes that occur over time.

111. (C) High, commonly above 70%

When a child loses a primary mandibular second molar early, the adjacent first permanent molar often drifts forward to fill the vacant space. Studies and clinical observations indicate a significant likelihood (often well above 70%) of mesial migration unless a space maintainer is placed. This drift can result in crowding or impaction of the second premolar. Contrary to (A) or (B), the risk is higher than 5% or 25%. Suggesting it is negligible (D) is clinically inaccurate. Timely intervention helps safeguard arch integrity, aiding proper eruption of the permanent successor.

112. (C) Results in drifting or tipping of adjacent teeth, leading to malocclusion

Retaining a primary tooth with no permanent successor can disrupt normal occlusal development. Surrounding teeth might tilt or shift in response, creating malaligned arches or closed spaces that hamper prosthetic replacement later. Prolonged presence of this tooth does not overgrow the jaw (A) nor is it typically associated with alveolar bone loss (B) unless periodontal issues arise. It also doesn't cause earlier exfoliation of other primary teeth (D). Understanding this cause-effect relationship allows dentists to consider extraction, space maintenance, or prosthetic planning if the tooth's long-term retention compromises overall occlusal harmony.

113. (A) Panoramic radiograph

A panoramic radiograph is the most efficient initial step to evaluate tooth development and identify congenital absence of second premolars. This single film captures the full jaw, revealing whether there are missing buds or impacted teeth, and provides a clear overview of the existing primary molars and their roots. While periapical radiographs (C) can show more detail of a specific area, a panoramic radiograph is simpler for an initial comprehensive assessment. Caries risk assessment (B) and salivary flow tests (D) do not confirm missing successors. Hence, a panoramic radiograph is the logical first choice.

114. (B) Hypodontia

Hypodontia is the congenital absence of one to six permanent teeth (excluding third molars). Seeing no lower second premolar buds on the radiograph indicates those teeth are congenitally missing, thus fitting the definition of hypodontia. Macrodontia (A) describes unusually large teeth. Gemination (C) is an anomaly where one tooth bud attempts to form two crowns, resulting in a bifid crown. Dilaceration (D) involves an abnormal bend in the root or crown. Therefore, identifying missing premolars qualifies as hypodontia. Proper documentation and planning, such as retaining or modifying primary molars, is vital for future occlusal stability.

115. (B) Retain the primary second molars and monitor occlusal development

When primary second molars remain intact and functional in a child with congenitally missing second premolars, extraction (A) or aggressive measures like implants (C) are premature. Implants are contraindicated until skeletal growth is near completion, typically late teens. Orthodontic closure (D) might be considered if there is severe crowding or alignment issues, but in a stable occlusion, prematurely closing these spaces can lead to discrepancy later. Conservatively retaining the primary molars while observing growth allows them to act as space maintainers and chewing units. Monitoring ensures timely intervention if mobility, infraocclusion, or arch irregularities develop over time.

116. (C) 8–10 years

Flossing requires a level of manual dexterity and cognitive understanding to maneuver the floss effectively between teeth without damaging the

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gums. Many pediatric dentistry guidelines suggest that children around 8 to 10 years old can start flossing independently if they demonstrate the required coordination. Younger children (A, B) typically lack fine motor skills, so parents often perform or closely supervise flossing. Waiting until 10–12 (D) may risk leaving tight contact areas uncleaned for too long. Supervised early introduction, gradually leading to independent flossing, is recommended when the child can handle the technique safely.

117. (B) Ectopic eruption path pressing on the root of the primary incisor

When radiographs show a permanent incisor poised to erupt but the primary incisor remains firmly in place, an ectopic eruption path is suspect. This misalignment can prevent normal root resorption of the primary tooth, inhibiting exfoliation. Increased mobility (A) would indicate normal exfoliation progression. Shade differences (C) are typical between primary and permanent teeth, not necessarily a red flag. Mild gum irritation (D) isn't conclusive evidence of an eruptive disturbance. Recognition of an ectopic path can guide intervention, such as selective extraction or orthodontic referral, to free the erupting tooth.

118. (A) The occlusal surface of the primary molar appears progressively lower than adjacent teeth

Infraocclusion occurs when a tooth fails to erupt at a rate consistent with adjacent teeth, leading it to appear "submerged" or lower in the dental arch. Clinically, this is noted as the tooth's occlusal plane dipping beneath that of neighboring teeth. Mobility (B) is not characteristic; infraoccluded teeth often have ankylosed roots, showing reduced mobility. A gray hue (C) might indicate pulp necrosis, unrelated to infraocclusion. A broad root trunk (D) is a morphological trait, not indicative of an eruption issue. Identifying progressive submersion is vital to prevent malocclusion or space loss.

119. (A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.

Infraoccluded (ankylosed) primary molars fuse to the alveolar bone, preventing normal eruption. This can halt alveolar growth in that segment, leading to a relative vertical deficiency compared to adjacent areas. If left unaddressed, the developing occlusion may display tipping of neighboring teeth and insufficient bone height for the future permanent replacement. Hence, early intervention—extraction or specialized restorative techniques—maintains alveolar continuity and helps guide normal occlusal development. Therefore, both the assertion and the reason are correct and related: ankylosis causes restricted alveolar growth, supporting the need for prompt intervention to avert long-term complications.

120. (A) Elective extraction to allow spontaneous eruption of successor

When a primary tooth is ankylosed (infraoccluded) but a permanent successor is developing properly underneath, removing the failing primary tooth is often advisable. Extraction frees up the eruptive pathway, preventing space loss or abnormal tipping. Simply building up the tooth (B) might temporarily restore occlusal function but won't resolve the underlying ankylosis, and an implant (C) in a growing child is contraindicated since alveolar growth isn't complete. Waiting for pain (D) can lead to more complex malocclusion. Early removal is a proactive step, potentially allowing the permanent successor to erupt into a normal position.

121. (D) Cone-beam computed tomography (CBCT)

Though periapical and panoramic radiographs are useful for general assessments, early ankylosis—where the tooth fuses to bone—may be subtle and difficult to visualize on conventional 2D imaging. CBCT offers a three-dimensional view of the tooth and its supporting structures, potentially revealing the absence of a periodontal ligament space or direct fusion areas. While a paralleling periapical (A) can confirm root integrity, it may not detect initial ankylosis. Occlusal radiographs (B) provide a broader arch overview but limited detail on fusing. CBCT's superior resolution and 3D reconstruction are best to confirm early ankylosis if clinically suspected.

122. (A) Monitor eruption periodically

Slight submergence of a primary molar with normal successor development may not necessitate immediate extraction. If the tooth is stable, pain-free, and the permanent bud is properly positioned, close monitoring is often the initial course. Early

removal (B) might be premature if no significant disruption has occurred. Placing a stainless steel crown (C) may help restore occlusal contact, but it's typically done if the tooth is compromised or if the occlusal plane difference is functionally significant. A pulpotomy (D) is indicated only for pulp involvement, which is not mentioned here. Therefore, monitoring is prudent.

123. (B) Observe eruption while maintaining regular check-ups

With partial infraocclusion and normally developing second premolars, routine monitoring is the best course. Regular check-ups track the growth and positional relationship. If the submergence worsens or if tipping of adjacent teeth becomes pronounced, extraction or restorative intervention may be revisited. Premature extraction (A) might lead to unwanted space closure. Implants (C) are contraindicated in a growing child, as they can't adapt to jaw development. Orthognathic surgery (D) is an extreme measure used primarily for significant skeletal discrepancies, not mild infraocclusions. Conservative observation allows for timely intervention only if clearly indicated.

124. (A) Spontaneous eruption of the permanent canine

Interceptive extraction of the overlying primary canine is a recognized orthodontic intervention that can eliminate the physical obstacle hindering the permanent canine's eruption path. If performed early, before the permanent canine's root is fully formed, spontaneous eruption often follows. Apical migration (B) and crossbite formation (D) are not typical results. Rapid space closure (C) is more likely if posterior teeth drift mesially, but in this scenario, the aim is precisely to free the eruption track. Close monitoring after extraction is essential to confirm the desired result and check for any residual eruption difficulties.

125. (B) Extraction of the primary canine can redirect the impacted canine's eruption path

Interceptive extraction of the primary canine is beneficial when a permanent canine is impacted and oriented in a way that might self-correct if enough space and a clear path are provided. By removing the primary canine, the erupting permanent canine may spontaneously shift into a more favorable eruptive position. This approach is not an immediate fix (A), but it often prevents more invasive procedures like surgical exposure or extensive orthodontics later. Suggesting primary canines are unnecessary after age 8 (C) is wrong, and stating interceptive extraction rarely helps (D) overlooks well-documented success in appropriately selected cases.

126. (C) A conservative restoration of incipient pit-and-fissure caries combined with sealant application

A preventive resin restoration involves removing minimal carious tooth structure in early pit-and-fissure lesions and then sealing the remainder of the fissure system. The approach prevents the spread of decay and preserves healthy enamel and dentin. Post-restoration, a sealant is typically applied over adjacent fissures, delivering both a restorative and preventive benefit. Full-coverage crowns (A) are more invasive. Temporary fillings (B) do not describe the combined approach with sealant. Orthodontic devices (D) serve a wholly different function. PRRs are a hallmark of minimally invasive dentistry in pediatric patients with early occlusal caries.

127. (C) Glass ionomer or resin-modified glass ionomer

Glass ionomer cements (GICs) and resin-modified GICs are commonly chosen for PRRs in children, particularly for shallow or incipient occlusal lesions. They offer chemical adhesion to tooth structure, release fluoride to aid in preventing recurrent decay, and are relatively easy to place. Amalgam (A) doesn't release fluoride and often demands more extensive tooth preparation. Zinc phosphate cement (B) lacks the fluoride release and modern adhesive properties. Gold foil (D) is rarely used in pediatric dentistry due to technique sensitivity, cost, and limited practical advantages. GIC materials therefore align with preventive and conservative objectives.

128. (C) They exhibit improved strength, esthetics, and lower solubility while still providing fluoride release

Resin-modified glass ionomer (RMGI) blends traditional glass ionomer's properties (chemical adhesion and fluoride release) with resin components, yielding superior physical strength and reduced solubility in the oral environment. This

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results in improved durability, better appearance, and the continued cariostatic effect from fluoride release—valuable in high-risk pediatric patients. They still require light activation and don't spontaneously cure in saliva (B). Complete degradation is undesirable (D), so that statement is incorrect. Furthermore, RMGIs retain fluoride release (A is false), which is key for inhibiting secondary caries and supporting preventive goals in pediatric dentistry.

129. (C) High brittleness leading to frequent bulk fractures

Composite resin restorations offer excellent esthetics, minimal tooth cutting when used with bonding systems, and robust adhesion when properly placed and cured. While composites can be technique-sensitive, they do not typically exhibit "high brittleness" leading to frequent fractures if appropriately chosen, bonded, and cured. Instead, modern composites are formulated with filler particles that give them reliable fracture resistance. Bulk fracturing typically results from technique errors or occlusal overload rather than an inherent brittleness. Therefore, labeling composites as "highly brittle" is an incorrect statement and not reflective of standard pediatric restorative outcomes.

130. (C) Glass ionomer chemically bonds to tooth structure and releases fluoride; composite relies on micromechanical bonding and has limited fluoride release

Glass ionomer cements (GICs) are valued for their self-adhesive property to enamel and dentin, along with continuous fluoride release. Meanwhile, composite resins bond primarily via micromechanical retention with the help of etch-and-bond systems, and their fluoride release—if present at all—is minimal compared to GICs. GICs often have acceptable but not superior esthetics to composites (A is incorrect). Composites demand stringent isolation for effective bonding, whereas GICs are more tolerant of moisture (D is false). Thus, the key distinction is chemical adhesion plus fluoride release for GICs, versus micromechanical bonding for composites.

131. (B) Resin-modified glass ionomer cement

A high caries-risk child benefits from a restoration that releases fluoride to inhibit recurrent decay and tolerates less-than-ideal isolation conditions. Resin-modified glass ionomer cement (RMGI) satisfies these requirements. Dental amalgam (A) is durable but lacks fluoride release and demands better moisture control for reliable longevity. Full ceramic inlays (C) are rare in pediatric patients due to cost, technique complexity, and short tooth lifespan before exfoliation. Direct gold foil (D) is technique-sensitive, expensive, and offers no fluoride release. Thus, RMGI is the ideal compromise of fluoride protection, adequate strength, and better moisture tolerance.

132. (C) Use a self-etching bonding system that tolerates slight moisture

Pediatric patients often have difficulty maintaining complete dryness. Modern self-etch or universal adhesives are formulated to tolerate slight moisture better than traditional total-etch systems, reducing the risk of bond failure due to saliva contamination. Direct placement on unetched enamel (A) won't provide adequate retention. Over-drying for 10 minutes (B) can desiccate enamel and dentin, compromising bond strength and being impractical. Saliva (D) obviously cannot serve as a bonding agent. Thus, selecting a moisture-tolerant adhesive approach improves outcomes in children who struggle with isolation and remain restless during treatment.

133. (B) Isolite or similar isolation device to control moisture

When children resist rubber dam placement, alternative systems like Isolite or DryShield can provide continuous suction, bite block support, and lighting. These devices help manage saliva and maintain a semi-open mouth, improving visibility and dryness. Doing nothing (A) leaves the site prone to contamination, risking restoration failure. Simply telling the child to keep their mouth open (C) is unreliable. Omitting needed restorations and placing only sealants (D) fails to address established proximal decay. Thus, using an advanced isolation aid often enhances cooperation and creates a suitable environment for successful restorative procedures.

134. (C) They provide full coronal coverage, preventing recurrent decay

Stainless steel crowns (SSCs) are widely used in pediatric dentistry due to their ability to encase the entire clinical crown, protecting it against further caries, fracture, and marginal leakage. While some tooth preparation is indeed required (A is false), the final restoration is retentive and durable. SSCs are not biodegradable (B); they remain until the primary tooth exfoliates. Though occasionally employed as interim restorations in adults, they are primarily tailored for children (D is overly general). Their straightforward placement and robust full coverage make them ideal for restoring severely decayed or pulpotomized primary molars.

135. (C) Placing a heavy chamfer margin around the entire tooth

Stainless steel crowns typically require minimal tooth preparation with an occlusal reduction (about 1 to 1.5 mm) and slight proximal slicing to break contacts. Margins for SSCs are feather-edged or slight chamfer, not a heavy chamfer (C). The goal is to keep the preparation simple and preserve tooth structure; a pronounced chamfer or bevel is not needed as with permanent crowns. Rounding line angles (D) helps seating and reduces stress points. Therefore, the incorrect step is intentionally creating a heavy chamfer margin, which complicates fitting and undermines conservative principles of pediatric crown preparation.

136. (D) 80–90% or higher

Pulpotomies in primary teeth, followed by a durable full-coverage restoration such as a stainless steel crown, typically demonstrate high success rates—commonly in the 80–90%+ range. This success hinges on maintaining proper technique, ensuring the radicular pulp is healthy, and sealing the tooth effectively to avoid bacterial reinvasion. Lower figures like 30% or 50% (A, B) would indicate suboptimal outcomes. Although some studies vary in exact percentages, 80–90% success is widely reported in the literature when all critical steps (diagnosis, medicament selection, and final restoration) are performed correctly and the tooth is monitored regularly.

137. (B) Progression undermines cusps, leading to a large cavity requiring full coverage

Interproximal caries can remain hidden until the lesion grows significantly, weakening the tooth structure around the marginal ridge and cusps. Eventually, this can result in a substantial cavity that necessitates full-coverage restoration to retain functional longevity in a primary tooth. Spontaneous disappearance (A) or self-sealing (D) are not realistic outcomes for active caries. Minor lesions can be restored with simpler fillings if detected early, but advanced lesions often compromise too much tooth structure to be restored with conservative approaches. Therefore, large interproximal breakdown frequently leads to an SSC for reliable long-term success.

138. (B) Stainless steel crown

In young pediatric patients, especially when there is difficulty achieving adequate isolation, a stainless steel crown is often chosen for posterior restorations. It tolerates moisture better than a composite or porcelain inlay and requires fewer precise steps. A partial gold onlay (C) or porcelain inlay (D) are uncommon for primary teeth due to cost, technique complexity, and the limited lifespan before exfoliation. SSCs provide a durable, full-coverage solution that protects weakened tooth structure, making them ideal for deep distal cavities with compromised moisture control in a four-year-old patient.

139. (B) Irreversible pulpitis of the coronal pulp only

Spontaneous night pain generally suggests irreversible pulpitis, indicating the pulp has progressed beyond a simple reversible inflammation. Given the absence of any radicular pathology on X-ray, the radicular pulp may still be relatively healthy. This scenario often aligns with a pulpotomy candidate, removing the inflamed coronal pulp while preserving the vital radicular pulp. Reversible pulpitis (A) usually presents with short, sharp pain triggered by stimuli, not prolonged night pain. Necrosis (C) or a chronic abscess (D) would typically show radiographic or clinical signs of periapical involvement. Thus, irreversible coronal pulpitis is the most fitting diagnosis.

140. (B) Pulpotomy

Since the child's night pain suggests the coronal pulp is irreversibly inflamed, yet no radicular pathology

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is evident radiographically, a pulpotomy is typically indicated. This involves removing the diseased coronal pulp and treating the radicular pulp with a medicament to maintain vitality. Indirect pulp capping (A) is for mild or reversible exposures. Pulpectomy (C) or extraction (D) are reserved for cases where the radicular pulp is infected or non-vital, or if the tooth is unrestorable. Therefore, pulpotomy—followed by a stainless steel crown for full coverage—is the recommended approach in this presentation.

141. (B) Formocresol or Mineral Trioxide Aggregate (MTA)

Traditional pulpotomy techniques for primary teeth have long used formocresol for its fixative properties, though concerns about formaldehyde have led many clinicians toward alternative medicaments like MTA. MTA encourages the formation of a hard tissue barrier and offers excellent biocompatibility. Eugenol (A) is typically found in zinc oxide eugenol but is not the primary pulpal medicament. Phosphoric acid (C) is part of bonding procedures for composites, not pulp therapy. Sodium perborate (D) is used in internal bleaching of non-vital teeth rather than pulpotomy. Thus, formocresol or MTA remain standard, guideline-based pulpotomy agents.

142. (D) Pulp therapy failure with radicular pathology

If a tooth previously treated with pulpotomy develops progressive external root resorption and lingering pain, it suggests that the radicular pulp may have become necrotic or infected. This scenario implies failure of the pulpotomy procedure, indicating radicular pathology. Ectopic eruption (A) is unrelated to root resorption in a treated tooth. Internal resorption (B) would be visible as a radiolucent enlargement within the canal, not external resorption. Pulp canal calcification (C) typically presents as reduced canal space, not root destruction. Thus, persistent pain and external resorption signal a failing pulp therapy requiring further endodontic or extraction management.

143. (A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.

Untreated or failed pulp therapy in a primary tooth can result in periapical pathology. Bacterial byproducts and inflammatory mediators can affect the tooth germ of the developing permanent successor. This intrusion may cause enamel hypoplasia or structural anomalies in the developing permanent crown. Consequently, the assertion that pulp therapy failure can harm the successor is correct. The reason—that radicular infections can spread to the follicle, causing defects—is indeed the mechanism by which damage occurs. Together, they accurately describe why maintaining healthy primary teeth is essential for safeguarding the normal development of permanent dentition.

144. (B) Pulpectomy or extraction, depending on tooth restorability and root condition

A chronic sinus tract and radiographic evidence of periapical involvement strongly indicate necrotic radicular pulp. Simply redoing the pulpotomy (A) or placing more medicament (C) won't suffice because the infection extends beyond the coronal pulp. Antibiotic therapy alone (D) doesn't eliminate the source of infection. If the tooth is structurally restorable and the roots are salvageable, a pulpectomy with a resorbable filling is indicated. However, if the tooth is severely compromised or close to exfoliation, extraction may be more practical. This approach addresses both the infection and the long-term prognosis of the tooth.

145. (C) Extent of root resorption and presence of periapical pathology on radiographs

Assessing the tooth's structural integrity, root length, and periapical region on radiographs is vital for deciding between pulpectomy and extraction. Extensive root resorption or large periapical lesions often render pulpectomy less feasible or successful. A minimal root with advanced infection can't retain a long-term restoration. While caries risk (A) influences prevention strategies, it doesn't solely dictate endodontic decisions. The child's sedation preference (B) is a secondary factor. Crown color (D) may hint at necrosis or pulp changes, but not to the same detail as radiographic evidence of resorption and pathology.

146. (D) Pulpectomy

Lingering or spontaneous pain suggests advanced pulpal inflammation, typically extending beyond the coronal pulp into the radicular region. Direct (A) or indirect (B) pulp capping are suitable for

minimal pulp exposures or reversible pulpitis, and a pulpotomy (C) is appropriate if the radicular pulp is healthy. However, in the presence of radicular symptoms, pulpectomy (D) is the logical choice, removing all necrotic or irreversibly inflamed pulp tissue from the crown and canals. This ensures complete debridement and reduces reinfection risk, permitting a resorbable filling before a final restoration is placed.

147. (D) Hall technique

The Hall technique involves sealing over carious lesions under a preformed stainless steel crown without traditional caries excavation or local anesthesia. This method deprives caries-producing bacteria of their substrate while preserving tooth vitality. Pulpectomy (A) is a full endodontic procedure for necrotic or irreversibly inflamed pulp. Non-restorative cavity control (B) might involve merely cleaning and monitoring but not sealing with a crown. ART (C) uses hand excavation and glass ionomer in minimal-resource settings, but not specifically the Hall approach. By placing the crown over caries, the Hall technique halts lesion progression and saves healthy tooth structure.

148. (C) Selecting a proper-fitting stainless steel crown and ensuring it fully seats

In the Hall technique, no local anesthesia or complete caries removal is performed. Instead, an appropriately sized stainless steel crown is placed over the carious tooth to isolate it from the oral environment, stopping further microbial activity. Ensuring the crown properly fits and fully seats is essential for success. Full seating prevents microleakage and fosters conditions that halt lesion progression. Complete excavation (A) and rubber dam usage with anesthesia (B) are not routine components of this technique. Leaving the tooth unsealed (D) perpetuates decay. Thus, a secure, well-adapted crown is the keystone to Hall technique success.

149. (C) Bacteria become starved of carbohydrates, reducing acid production

When caries is sealed off from the oral environment, salivary and dietary substrates can no longer reach the bacteria. The microbes become nutritionally deprived, shifting towards fewer acidogenic strains and diminishing overall acid production. This environment leads to arrest or slowing of lesion progression. The notion that bacteria numerically increase but lose virulence (A) lacks clinical support. Option (B) contradicts Hall technique outcomes, as sealed caries typically stabilizes rather than spreads. Bacteria mutating into more virulent forms (D) is unfounded. Therefore, starved bacteria with diminished acid output is the recognized mechanism behind Hall technique success.

150. (C) Minimally invasive caries excavation using hand instruments and placing an adhesive restorative material

Atraumatic Restorative Treatment (ART) focuses on minimally invasive caries removal using only hand instruments, omitting rotary drills and local anesthesia whenever possible. The technique commonly employs glass ionomer cement as the restorative material due to its adhesive and fluoride-releasing properties. ART is often practiced in community or field settings where advanced dental equipment is limited, making it practical and cost-effective. Ceramic inlays (A) or high-speed drilling with sedation (B) are not part of ART principles. While composite can be used in modern ART adaptations, the hallmark remains conservative hand excavation (D is incomplete in describing the process).

151. (B) Gradually guiding a child toward cooperative behavior by reinforcing desired actions

Behavior shaping is a cornerstone of pediatric dentistry, relying on positive reinforcement and incremental engagement to foster cooperation. The dentist and staff use clear communication, praise, and small achievable goals (like opening the mouth briefly) to gradually acclimate a child to the dental environment. Option (A) focuses on sedation only, ignoring the critical nonpharmacological techniques. Option (C) omits important psychological preparation and can trigger anxiety. Option (D) can lead to incomplete care if a child refuses necessary procedures. Skillful behavior shaping encourages children to develop trust and actively participate in their own dental care.

152. (C) The dentist demonstrates the sensory experience and then performs the actual procedure (the "Do" step)

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"Tell-Show-Do" is a classic behavior management strategy. First, the dentist tells the child (in simple terms) what will happen. Next, the dentist shows them the instruments and possibly simulates how it will feel. Immediately following the "Show" stage is the "Do" stage—gently carrying out the actual procedure while maintaining the child's comfort and trust. Letting the child perform the procedure on a model (B) can be part of a broader demonstration, but it's not the standard immediate next step. Delaying all treatment (D) is reserved for extraordinary circumstances, not a normal approach here.

153. (C) By rewarding desired behavior, making the child more likely to repeat it

Positive reinforcement is a foundational psychological principle whereby rewarding a desired behavior (like sitting still or opening wide) increases the likelihood of that behavior being repeated. In pediatric dentistry, this can take the form of verbal praise ("Good job keeping your mouth open!"), stickers, or small toys. Punishment (A) is counterproductive, risking fear or resentment. Sedation (B) is not a first-line reaction to mild reluctance. Ignoring communication (D) can exacerbate anxiety. Thus, consistent, genuine positive reinforcement fosters trust and a cooperative mindset, improving the child's comfort during subsequent dental visits.

154. (D) Forced restraint without consent

Non-pharmacological behavior guidance emphasizes communication skills, rapport building, and methods like "tell-show-do," voice control, distraction, and in some cases separating parents from the operatory if the child responds better one-on-one. However, forced restraint without proper parental consent (D) can be unethical and harmful to the child's trust. Any protective stabilization technique must be thoroughly explained and agreed upon beforehand, as well as used only when lesser measures have failed or when safety is an urgent issue. Emphasizing informed consent, empathy, and skillful interactions is essential for humane and effective pediatric dental treatment.

155. (B) Aversive approaches use negative stimuli or reprimands to gain cooperation; positive rely on praise and rewards

Aversive strategies might include harsh voice control or reprimands to curtail undesirable behavior, whereas positive methods center on reinforcement and praise for cooperative behavior. Although some older behavior management approaches leaned on aversive or punishment-based cues, contemporary pediatric dentistry predominantly endorses positive techniques. Sedation (A, C) is not exclusively tied to aversive or positive approaches; it's a separate modality often used in more challenging cases. Finally, aversive methods are not considered first-line by today's standards (D). Instead, the focus is on non-threatening communication, supportive training, and respectful methods to minimize fear and anxiety.

156. (A) Tell-Show-Do with positive reinforcement

A well-behaved 5-year-old is often amenable to classical non-pharmacological techniques: explaining procedures in child-friendly terms (Tell), demonstrating instruments or sensations (Show), then proceeding gently (Do). Positive reinforcement for cooperation keeps the experience encouraging and helps build trust. Protective stabilization (B) or general anesthesia (C) is reserved for children who are either uncooperative, have special healthcare needs, or require extensive work that can't be managed otherwise. Threatening negative consequences (D) can produce fear and damage rapport. Hence, simple Tell-Show-Do and reinforcement remain the best starting point for a cooperative child's routine dental procedure.

157. (C) Use distraction and a calm tone of voice, explaining the steps briefly

For mild anxiety, employing a calm, reassuring tone while offering simple, age-appropriate explanations can reduce fear. Distraction—like engaging the child in conversation or having them watch a video—also helps shift focus away from the syringe. Providing some sense of control and predictability fosters trust. Avoiding any explanation (A) can heighten worry, and suddenly injecting (B) might scare the child and break cooperation. General anesthesia (D) is an extreme measure for mild fear, suitable only when other techniques fail or if extensive procedures are needed. Hence, gentle, supportive communication remains the key.

158. (B) Provide thorough information to the parent/guardian and obtain informed consent

Nitrous oxide sedation is considered a mild sedation method in pediatric dentistry, requiring informed consent and clear explanation of benefits, risks, and expectations. Before administering any sedation, it's crucial to communicate with parents, address questions or concerns, and gain documented approval. Simply placing the nasal hood without consent (A) is unethical and unprofessional. Sending a child home with sedatives (C) must follow specific protocols if indicated, but it's not the immediate next step for in-office nitrous oxide. Physical restraint (D) is a last resort, only for urgent situations and with explicit consent.

159. (C) It offers rapid onset and quick recovery while maintaining protective reflexes

Nitrous oxide sedation, often called "laughing gas," acts quickly and wears off soon after discontinuation. It induces mild to moderate sedation, allowing the child to remain conscious and keep protective reflexes intact. Deep unconsciousness (A) would necessitate more advanced monitoring and is usually associated with general anesthesia. Nitrous oxide does not preclude the use of local anesthesia (B) for pain control, as it mainly alleviates anxiety. While basic patient monitoring is necessary, especially pulse oximetry, it does not require the extensive measures or prolonged fasting typical of deeper sedation or general anesthesia (D).

160. (C) Provide no oxygen flush at the end of the procedure, ending sedation abruptly

Nitrous oxide sedation protocols typically require starting with 100% oxygen to establish flow, then gradually introducing nitrous oxide in increments until the desired sedation level is reached. During the procedure, continuous communication and observation ensure safety and comfort. At the end, a crucial step is to flush with 100% oxygen for several minutes to prevent diffusion hypoxia, which can occur if nitrous oxide is abruptly discontinued. Failing to provide an oxygen flush (C) is incorrect and may cause post-sedation headaches or dizziness. Thus, the standard practice includes finishing with a few minutes of pure oxygen.

161. (C) Less than 5%

With appropriate administration—careful titration, monitoring, and avoidance of excessive concentrations—nitrous oxide is remarkably safe for pediatric use. Severe side effects like intense nausea or vomiting are relatively rare, generally under 5% in properly selected patients. Most negative reactions stem from over-sedation or insufficient oxygen flush at the end. Hence, while mild transient dizziness or lightheadedness can happen, serious complications remain uncommon. The incorrect options (A, B, D) suggest a higher incidence than typically reported in clinical studies. Thus, the likelihood of significant adverse reactions is fairly low when performed following recommended guidelines.

162. (A) The child may become extremely fearful, refuse future dental care, and develop untreated caries

Unmanaged pediatric dental fear can create long-term issues, including avoidance of future care, which in turn exacerbates oral health problems. If minimal sedation isn't successful and no further accommodation—like deeper sedation or behavior modification—is offered, the child may leave traumatized. They could refuse treatments in the future, leading to progression of caries or other oral diseases. Anxiety usually doesn't spontaneously disappear (B). Self-sedation at home (C) is neither plausible nor recommended. Caries does not resolve naturally (D). Therefore, ensuring a workable approach to sedation or alternative management can be vital for preserving trust and oral health.

163. (B) General anesthesia in a hospital setting

If a child's anxiety level exceeds what can be managed by nitrous oxide or oral sedation, and extensive treatment is needed in one session, general anesthesia is typically the most reliable and humane method. It allows comprehensive care while the child is fully unconscious, minimizing psychological trauma. Oral sedation alone (A) may still prove inadequate for severe anxiety with extensive procedures. Simple voice control (C) already failed if minimal sedation couldn't help. Physical restraint (D) without sufficient sedation or anesthesia is ethically problematic and can be traumatic. General anesthesia ensures safety, cooperation, and completion of all necessary treatments.

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164. (B) Dim lighting, using noise-cancelling headphones or earplugs, and a gentle introduction of instruments

Children on the autism spectrum often have heightened sensory sensitivities to sound, light, and touch. Adjusting the clinical environment by dimming overhead lights, using noise-cancelling headphones or earplugs, and softly introducing instruments can markedly reduce overstimulation. Forcing cooperation (A) without addressing these concerns intensifies distress. Loud music (C) may further aggravate sensory overload. While multiple shorter appointments (D) can sometimes help with attention span and familiarity, they don't specifically mitigate the child's sensory triggers. Hence, environmental modifications that lower stress and sensory input are pivotal for effective, compassionate care of autistic children in dentistry.

165. (B) Gentle "Tell-Show-Do," additional time for communication, and possible nitrous oxide

For children with mild intellectual disability who can understand simple directives but struggle with attention, non-pharmacological measures like "Tell-Show-Do" are often effective. Allowing extra time to communicate instructions in a stepwise fashion and potentially using nitrous oxide for mild sedation can further enhance cooperation. Severe or abrasive voice control (A) and threats undermine trust. Jumping straight to sedation or general anesthesia (C, D) may be unnecessary if simpler measures suffice. Using calm, adapted communication strategies and mild sedation as needed fosters a supportive environment, enabling the child to receive safe, routine restorative treatment.

166. (C) Parents may remain if it helps the child feel secure, especially in younger children

Current recommendations acknowledge that parental presence can be reassuring for some pediatric patients, enhancing comfort and reducing fear, especially in younger or anxious children. However, each case differs: some children do better when the parent waits outside, especially if the parent's anxiety transfers to the child. It's not mandatory always to exclude parents (A), nor is it correct to say they have no role after the child sits down (B). Although parental presence can occasionally complicate behavior, it is not universally detrimental (D). Properly managed parental involvement often improves overall cooperation and trust.

167. (C) The child shows extreme fear with tears, trembling, and total unresponsiveness to usual calming measures

A severe and unyielding anxiety response (crying uncontrollably, trembling, or resisting all comforting techniques) signals a red flag. Such intense fear can impede safe and effective treatment, suggesting the need for pharmacological sedation or advanced behavior management. A good prior experience (A) typically fosters cooperation, not fear. Calm parental reassurance (B) and mild hesitance (D) do not automatically necessitate sedation if the child can eventually be guided to comply. Thus, when standard non-pharmacological approaches fail to quell overwhelming fear, reevaluating sedation or other specialized interventions becomes the logical next step.

168. (C) Persistent crying escalating to screaming, physical resistance, and inability to communicate

A child who becomes inconsolable—crying unrelentingly, screaming, physically resisting treatment, and refusing verbal interaction—reveals that anxiety has escalated beyond mild apprehension. Mild anxiety often appears as fidgeting or requesting occasional breaks (A, B), but the child can still respond to reassurance. A child still willing to continue with gentle persuasion (D) is not in severe distress. Recognizing these intense signals is vital: it helps dentists decide if sedation, rescheduling, or an alternative approach is needed to avoid inflicting psychological trauma and to perform care effectively and safely.

169. (A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.

Child-friendly or euphemistic language ("sleepy juice" for local anesthetic, "tooth raincoat" for rubber dam) helps demystify unfamiliar concepts. It addresses both cognitive and emotional needs, reducing the fear that might arise from hearing clinical or ominous-sounding terms. Medical jargon can confuse children and escalate anxiety because they can't interpret it properly, exacerbating an already stressful situation. Thus, the assertion that using child-friendly language is crucial stands

true. The reason that complex language raises anxiety through incomprehension clarifies why. Both statement and explanation align to show the importance of age-appropriate communication.

170. (C) Reassure the child, consider supplemental sedation per treatment plan, or terminate the procedure if it's unsafe

When moderate sedation fails to provide adequate anxiolysis or sedation, the dentist must ensure the child's safety and comfort remain paramount. They can pause and provide calming reassurance, evaluate if a pre-approved supplemental dose (within safe limits) is feasible, or conclude the procedure if it poses harm or distress. Automatically escalating to general anesthesia (A) is risky without proper assessment or the necessary setting. Forcing treatment (B) can traumatize the child. Permanently dismissing them from care (D) is unwarranted. Adhering to sedation protocols, including possible rescheduling or deeper sedation in an appropriate facility, is the correct response.

171. (B) Specific stimuli or situations that elicit dental fear

The Fear Survey Schedule for Children (FSSC) is a validated tool that helps professionals identify the particular aspects of dental treatment—needles, drill sounds, clinical environment, etc.—that provoke anxiety. It assists in tailoring interventions and focusing on the triggers each child finds most unsettling. Radiographic caries risk (A) or IQ level (C) isn't measured by this instrument, and it doesn't evaluate visual acuity (D). Pinpointing these fear-inducing elements can guide the dentist in employing targeted strategies, such as noise cancellation, child-friendly language, or distraction aids to mitigate the child's anxiety more effectively.

172. (B) Live modeling

Live modeling exposes an anxious child to a peer or sibling exhibiting cooperative behavior during a dental procedure. Observing another child remain calm and unafraid often reassures the younger one that the situation is safe. Audiovisual distraction (A) would involve videos or music. Negative reinforcement (C) centers on removing negative stimuli to reinforce desired behavior, and voice control (D) uses changes in tone or volume. Thus, having an older sibling "model" good behavior directly in the clinical setting is classic live modeling, often effective for children with mild dental fear.

173. (C) Reinforcement scheduling

Reinforcement scheduling—especially a "token economy" or "interval reinforcement"—involves breaking tasks into manageable steps and rewarding the child after each successful segment, encouraging them to continue cooperating. This approach is particularly helpful for kids with ADHD, who often respond well to structured tasks and frequent positive feedback. Flooding (A) typically forces an individual to face fears all at once, which is not suitable for pediatric dentistry. Systematic desensitization (B) gradually introduces fear stimuli in a controlled manner, but it's more common in therapy settings over extended time. Physical restraint (D) isn't indicated for mild restlessness.

174. (A) Sensory adaptation to reduce overstimulation

Children with severe autism can be extremely sensitive to loud sounds, bright lights, and unfamiliar tactile stimuli. Lowering the lights and introducing soft, preferred music helps create a more soothing environment, diminishing the overstimulation that often triggers resistant behavior. The aim is calming adaptation, not instilling fear (B). Flooding the environment with additional stimuli (C) could worsen the child's distress. Physical punishment (D) is ethically unacceptable and counterproductive in managing special needs patients. Therefore, making environmental modifications that accommodate a child's sensory needs reflects a core strategy for improving comfort and cooperation in autism care.

175. (B) Systematic desensitization via controlled exposure to the feared sound and sensation

Systematic desensitization involves gradual exposure to a feared stimulus in a structured, reassuring manner, allowing the child to become familiar with the sound and feel in a non-threatening setting. By gently introducing the cordless handpiece away from the main operatory, demonstrating its mild vibration on a cotton roll, and letting the child briefly control the pedal, the dentist helps the child adapt to the stimulus. Cognitive restructuring (A) focuses on changing negative thoughts into positive

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ones but is less direct. Flooding (C) forces an intense encounter all at once, which can be overwhelming. Avoidance (D) doesn't resolve fear.

176. (B) Simplify communication to two instructions repeated twice

The "2×2 Rule" in pediatric communication underscores how brevity and repetition can enhance comprehension. By limiting verbal instructions to two main points, repeated twice, a child is more likely to retain and follow them. Children, especially younger ones or those with attention difficulties, can become confused or overwhelmed by complex or lengthy explanations. The rule is not about staff ratios (A), nor does it revolve around warnings (C). Allowing the child to direct treatment with no instructions at all (D) is contrary to effective practice. Thus, concise, repeated instructions often yield better compliance.

177. (B) Observing a cooperative peer or sibling undergoing a procedure

LIVE modeling involves having an anxious or inexperienced child observe another, more cooperative child (perhaps a sibling or another patient of similar age) undergo a dental procedure calmly and successfully. This real-world demonstration often reassures the observer that the procedure is safe and manageable. Watching a cartoon character (A) is an example of filmed or symbolic modeling, not live. Sitting alone in the operatory (C) is not modeling. Electronic sedation (D) doesn't relate to modeling but to sedation technology. Hence, seeing a peer model the behavior fosters confidence and reduces fear.

178. (B) "Tell-play-do" introduces an interactive game or playful element before performing the actual procedure

In pediatric dentistry, "tell-play-do" enhances the child's engagement by adding a fun or exploratory stage. Beyond simply showing instruments (as in "tell-show-do"), the child might play with safe dental tools or engage in a brief role-play, letting them associate the experience with positive feelings. This fosters familiarity and reduces fear. The original "tell-show-do" approach includes explanation and demonstration, but less emphasis on playful interaction. Options (A) and (C) incorrectly attribute sedation or omit explanation entirely, and they are certainly not identical (D). The key difference is the "play" aspect that fosters a comfortable, game-like environment.

179. (B) Voice control must always be accompanied by an explanation to the child about the reason for a louder or firmer tone

Voice control involves adjusting tone, volume, or pace to gain a child's attention or guide behavior quickly. While it's generally good practice to reassure the child afterward, it does not necessarily require an immediate, detailed explanation each time you change your tone. Often, the child may not cognitively process an in-depth rationale in the moment. However, a brief reassuring explanation afterward is recommended, but not mandatory at the exact moment of raising one's voice, particularly if the child is in danger or about to make a sudden move. All other options accurately reflect acceptable pediatric dentistry principles.

180. (A) Distraction shifts the child's focus away from unpleasant stimuli; desensitization gradually exposes the child to fear-inducing stimuli in a controlled manner

Distraction aims to reduce anxiety or fear by diverting a child's attention to something else, like videos, music, or conversation. It's immediate and doesn't directly address the root fear, rather it displaces it. Conversely, desensitization systematically introduces the fearful stimulus in small, tolerable increments, allowing the child to adapt and build tolerance over time. The statement that desensitization is only used with sedation (B) is inaccurate; it's a broader psychological technique. Option (C) incorrectly asserts that distraction always uses music, and (D) states they're identical, which overlooks the distinct mechanisms and goals of each approach.

181. (B) Provide brief, reassuring answers, then redirect focus to the procedure

Curious or anxious children may ask repeated questions to ease their worries. Completely ignoring them (A) could increase anxiety, while forbidding them to talk (C) is harsh and can damage trust. Stopping treatment each time they speak (D) prolongs the appointment unnecessarily. By giving

concise, reassuring explanations ("Yes, this tool just cleans your tooth," "We're almost done—great job!"), then gently guiding the child's attention back, the dentist fosters a sense of security and keeps the pace efficient. This balanced approach respects the child's needs while maintaining momentum to complete the procedure.

182. (A) Distraction

When the child becomes distressed by the sound of the handpiece, turning on a cartoon overhead is a classic distraction strategy. It redirects the child's attention away from the unpleasant noise, easing anxiety so that treatment can resume. Live modeling (B) involves watching another cooperative patient or sibling. Systematic desensitization (C) gradually exposes the child to the feared stimulus, but here, the dentist is simply diverting attention. Parental separation (D) removes the parent from the room, not relevant to this specific instance. Thus, the immediate cartoon usage exemplifies a direct distraction technique.

183. (C) Begin by introducing very minor stimuli, like sitting in the dental chair for short intervals, gradually increasing exposure

Systematic desensitization involves creating a hierarchy of fear-inducing stimuli, starting with something the child can comfortably handle and systematically building tolerance. Having the child start with short, non-threatening experiences—like just sitting in the chair—helps them realize they can remain calm. This forms the foundation for advancing to more challenging aspects like the sound of instruments or actual restorations. Watching a friend's filling (B) is modeling, not necessarily a first step in desensitization. Scheduling a long, comprehensive visit (A) may overwhelm the child, and immediate IV sedation (D) is excessive unless simpler methods fail.

184. (B) Providing pleasant pictures or videos of children happily receiving dental care before the appointment

Positive Pre-Visit Imagery uses cheerful, non-threatening depictions of dental experiences—like pictures, children's shows, or brochures with smiling kids in a dental setting—to create a favorable preconceived notion of treatment. This reduces anxiety by framing the visit as pleasant and routine. Option (A) would heighten fear. Avoiding all information (C) deprives the child of beneficial, positive context. Telling a child to expect pain (D) can escalate anxiety. Hence, presenting encouraging visuals before the appointment fosters an optimistic mindset, helping them approach the real experience with less trepidation.

185. (B) Continuing a stern tone indefinitely without returning to a softer voice

Voice control involves temporarily altering vocal qualities—volume, tone, pace—to refocus a child's attention or interrupt inappropriate behavior. Once cooperation is regained, the voice typically reverts to a comforting, calm tone. Prolonged sternness (B) could elevate tension or fear, eroding trust. Options (A) and (D) are standard components: a noticeable shift in volume or tone and using the child's name to ensure they realize the message is directed at them. Option (C) underscores the importance of reassuring the child that the dentist remains supportive and kind after applying a firmer voice.

186. (B) Child shows increased anxiety and reduced cooperation

A parent exhibiting high anxiety can unintentionally escalate the child's apprehension by transmitting signals of stress. Likewise, if the parent contradicts or overrides the dentist's instructions, it confuses the child and undermines the authority of the dental professional. This chaotic scenario typically reduces cooperation. While some children might ignore parental anxiety, it's more common to mirror it, leading to greater fear (B). A dramatic improvement (A) is unlikely with an interfering parent. No effect (C) or spontaneous cooperation (D) are less probable once the child senses the parent's tension or conflicting directives.

187. (B) Operant conditioning via positive reinforcement

Operant conditioning, described by B.F. Skinner, posits that behaviors reinforced with rewards tend to be repeated. In a dental setting, praising the child and giving tokens (stickers, small toys) after cooperative actions exemplifies positive reinforcement. The child learns that compliance yields immediate, pleasant consequences. Negative reinforcement (A) involves removing an unpleasant

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stimulus to increase a desired behavior, which doesn't apply here. Classical conditioning (C) pairs neutral stimuli with unconditioned stimuli to elicit a conditioned response, not specifically about rewarding a behavior. Observational learning (D) focuses on imitating others, whereas here, the direct reward drives the behavior.

188. (B) Token economy

A token economy is a structured form of positive reinforcement where children earn tokens (stars, points) for desirable behaviors, which they can later exchange for a reward (like a toy). This systematic process helps them visualize progress and remain motivated. General anesthesia (A) is a sedation method, not a behavior management system. Voice control (C) involves modulating tone. Negative reinforcement (D) removes an aversive element to encourage a behavior, which is different from offering a reward. Hence, the dentist's star chart culminating in a small prize exemplifies a classic token economy approach.

189. (B) Pediatric psychologist or child psychiatrist

When a child's behavior consistently disrupts dental care beyond typical anxieties or mild ADHD, deeper emotional or psychological factors may be involved. A pediatric psychologist or child psychiatrist can diagnose underlying disorders (e.g., severe anxiety disorders, phobias, or other behavioral conditions) and recommend targeted interventions. Orthodontists (A) handle tooth alignment issues, while oral surgeons (C) deal with surgical conditions. A primary care physician (D) is helpful but might still need to refer further for specialized behavioral assessment. Collaborating with a mental health professional is key when standard dental behavior techniques fail repeatedly.

190. (B) Stop, console the child, possibly reschedule with a deeper sedation plan

Continuing forcefully (A) risks psychological trauma and physical harm. Threatening the child (D) is unethical. Arbitrarily increasing sedation (C) could breach safety margins and sedation protocols. The prudent course is to halt the procedure, reassure and calm the child, and arrange a new visit with a more suitable approach—perhaps deeper sedation, general anesthesia, or specialized behavior guidance. Stopping the procedure acknowledges the child's limits and upholds a compassionate standard of care. Maintaining trust is crucial to future cooperation, so prioritizing emotional well-being and reconsidering sedation strategies is both ethical and effective.

191. (C) It must be used only when absolutely necessary and with informed consent

Protective stabilization in pediatric dentistry is strictly governed by professional guidelines. It's reserved for situations where a child's uncontrollable movement presents a risk of injury or when urgent care cannot otherwise be safely accomplished. Full informed consent from parents or guardians is essential, as it can be distressing. Routine or indiscriminate usage (B) is not endorsed, and it certainly can have psychological consequences if misapplied (D). Failing to obtain consent (A) is unethical and violates standard practice. Therefore, the core principle is that restraint is employed only as a last resort with explicit parental agreement.

192. (C) Post-traumatic stress or heightened anxiety

Children's emotional states can drastically change following a significant life trauma, even if it seems unrelated to dental visits. Traumatic incidents may trigger post-traumatic stress or escalate general anxiety, which can manifest in previously low-stress environments like the dental office. Delayed tooth eruption (B) or alveolar bone loss (D) are unrelated to sudden fear or behavioral changes. Claiming no correlation (A) overlooks how psychological distress can spill over into the dental setting. Recognizing a potential post-traumatic reaction is key to adjusting behavior management approaches and possibly coordinating care with mental health services.

193. (A) Both Assertion and Reason are true, and the Reason is the correct explanation of the Assertion.

Persisting with a procedure when a child is overwhelmed by fear or pain often heightens their distress, risks incomplete treatment, and fosters future dental anxiety or phobia. Unresolved negative experiences can lead individuals to avoid dental care, exacerbating oral health problems in adolescence or adulthood. Thus, the assertion that continuing in such circumstances can be counterproductive is correct,

and the reason—that traumatic experiences lead to lifelong dental avoidance—accurately explains why. Stopping or rescheduling with better sedation or behavior management can preserve a more positive relationship with dental care, preventing the cycle of escalating fear and avoidance.

194. (C) It allows comprehensive treatment in one session with full control of the airway, ensuring safety

When sedation has failed repeatedly, or if the child needs extensive dental procedures they cannot tolerate while awake, general anesthesia becomes a viable option. In a hospital setting, an anesthesiology team can secure and monitor the airway, providing a controlled environment for a painless, anxiety-free experience. Option (A) is incorrect because non-pharmacological methods are always attempted first. GA renders the child unconscious, not conscious (B). It is not banned by pediatric guidelines (D); instead, guidelines specify criteria for its use, prioritizing the child's safety and psychological well-being. Thus, hospital-based GA often resolves complex, stressful cases efficiently.

195. (B) Frankl Behavior Rating Scale

The Frankl Behavior Rating Scale is commonly employed in pediatric dentistry to categorize a child's behavior and attitude toward treatment. Scores range from definitely negative to definitely positive, offering a quick assessment of how cooperative or fearful the child appears. The Dental Age Index (A) or DMFT index (D) measure tooth maturity or caries experience, respectively, not behavior. CPITN (C) is a periodontal screening measure for population-level gum health. Thus, the Frankl scale is the best-known tool among the options for appraising pediatric patient cooperation and overall behavioral disposition pre-treatment.

196. (B) Negative

The Frankl Behavior Rating Scale ranges from 1 to 4 (often labeled as definitely negative, negative, positive, and definitely positive). A child who initially permits minimal examination (like a mirror) yet then starts crying and won't cooperate at the first sign of a handpiece likely demonstrates more negative than positive behavior. If the child was severely resistant from the start, refusing even the mirror, that might be "definitely negative" (1). "Positive" or "definitely positive" (3 or 4) would correspond to cooperative, relaxed attitudes. Hence, mild initial cooperation but subsequent distress aligns with a "negative" score (2).

197. (C) Positive

"Positive" (Frankl rating 3) describes a child who cooperates but may display minor reservations, such as asking the dentist to pause when feeling discomfort or anxiety. After reassurance, the child returns to compliance. "Definitely negative" or "negative" would show strong, persistent opposition, crying, or refusal to proceed. "Definitely positive" typically indicates a child who is enthusiastic or unreservedly cooperative, even enjoying the visit. Here, the child is overall cooperative but experiences some moments of anxiety (asking to stop). Because he continues after reassurance, his behavior is generally positive rather than highly negative or definitively negative.

198. (B) Tailoring the dental setting to the child's specific behavioral and attention needs

When treating a child with ADHD, planning short, focused appointments and decreasing wait times helps accommodate reduced attention span and prevents restlessness or frustration that may spark outbursts. Reward charts incentivize cooperation through positive reinforcement. This approach is clearly aimed at addressing the child's individual needs, not ignoring them (C) or defaulting to adult-based protocols (D). Minimizing sedation cost (A) isn't the primary motive here—rather, it's about structuring the environment to reduce triggers and manage behavior effectively. Hence, the key principle is customizing the dental setting and behavior management strategies to the child's ADHD-related challenges.

199. (C) Acclimatization or familiarization visit

An acclimatization or familiarization visit is a strategy where, in a low-pressure setting, a highly anxious child meets the dentist, sees the office, and interacts with some instruments without receiving actual treatment. This fosters comfort and trust, often leading to better cooperation later. Flooding (A) forces immediate confrontation with the fear. Deferred gratification (B) indicates

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delaying a reward, not describing this scenario. Negative reinforcement (D) involves removing an aversive stimulus to strengthen a desired behavior. By contrast, a "getting-to-know-you" visit helps the child feel safe and positive about the office, facilitating subsequent procedures.

200. (C) To address all treatment needs safely under controlled sedation, reducing trauma and ensuring efficiency

When a child's severe anxiety combined with extensive treatment needs makes typical behavior management and lighter sedation insufficient, general anesthesia in a controlled setting ensures the procedure is completed safely and efficiently in a single session. It reduces the psychological impact of multiple difficult visits and prevents incomplete treatments. Option (A) regarding personal time off is irrelevant. Suggesting it bypasses behavior shaping entirely (B) neglects that less-invasive strategies have already failed. Claiming general anesthesia is cheaper (D) is generally inaccurate, as GA often entails higher costs. Thus, ensuring comprehensive care with minimal trauma is the strongest rationale.

CHAPTER 05

PERIODONTOLOGY

1. (C) Increase in gingival size involving marginal and interdental areas

   Gingival enlargement refers to an overall increase in the bulk of gingival tissue that often includes the marginal and interdental areas. This enlargement can be due to inflammation, fibrotic overgrowth, or medication-induced changes. It differs from simple edema, which typically presents only as puffy tissue without significant fibrotic expansion. Additionally, gingival overgrowth can extend beyond the free gingiva, unlike conditions confined only to alveolar mucosa or papillary tips. Recognizing the scope of enlargement is critical for proper diagnosis, which leads to tailored treatment strategies such as improved oral hygiene, professional debridement, or surgical correction.

2. (B) Porphyromonas gingivalis

   Chronic gingivitis frequently involves a microbial biofilm comprising multiple bacterial species, with Porphyromonas gingivalis being notably significant. This anaerobic pathogen produces virulence factors such as gingipains that disrupt the host immune response and degrade periodontal tissues. While Aggregatibacter actinomycetemcomitans is heavily associated with aggressive forms of periodontitis, and Fusobacterium nucleatum plays a role in bridging early and late colonizers, P. gingivalis remains a key red-complex bacterium in chronic gingival inflammation. Streptococcus mutans is primarily implicated in dental caries rather than in chronic gingival conditions.

3. (C) Initial endothelial changes and increased vascular permeability

   The earliest stages of gingivitis involve vascular changes within the gingival tissues, particularly endothelial activation and increased permeability. These phenomena allow inflammatory cells and fluid to migrate from the bloodstream into the gingival connective tissue, initiating swelling, redness, and bleeding on probing. Apical migration of the junctional epithelium and connective tissue attachment loss are more characteristic of periodontal breakdown rather than initial gingivitis. Pocket formation and bone loss are later signs seen in periodontitis, reflecting deeper tissue destruction and disease progression once the initial inflammatory stages have gone unaddressed.

4. (B) Periodontal pocket formation exceeding 5 mm

   Chronic gingivitis typically presents with changes confined to the gingival tissues, such as redness, swelling, and a tendency to bleed on probing. Although pseudopockets can form due to swelling, true periodontal pockets exceeding 5 mm generally reflect more advanced breakdown of the periodontium, indicative of periodontitis. Gingivitis, by definition, does not involve significant attachment loss or bone resorption. Thus, observing pockets beyond 4 mm points toward progression to periodontal disease. Proper oral hygiene and professional scaling generally reverse the inflammatory changes observed in gingivitis before pocketing and bone loss occur.

5. (B) Acute gingivitis typically has a sudden onset and pronounced symptoms, while chronic gingivitis develops more slowly

   Acute gingivitis typically arises suddenly and is often characterized by marked inflammation, tenderness, and bleeding. The tissues may appear bright red and may be painful, reflecting the intense inflammatory response. By contrast, chronic gingivitis develops over an extended period and may show more subtle signs such as mild swelling, slight redness, and a reduced tendency to bleed, although it can occasionally bleed spontaneously. Chronic cases often display a more fibrotic tissue consistency due to prolonged inflammation. Bone loss is not a hallmark of either acute or chronic gingivitis; it marks a transition to periodontitis.

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6. (C) Professional scaling and patient education on oral hygiene

Addressing plaque-induced gingivitis typically starts with thorough mechanical debridement and effective patient education about brushing, flossing, and other oral hygiene measures. Removing plaque and calculus deposits prevents ongoing irritation to the gingival tissues and halts disease progression. Chlorhexidine mouth rinse can be an adjunct but is seldom sufficient as a standalone therapy for plaque removal. Systemic antibiotics are not routinely indicated for uncomplicated chronic gingivitis. Surgical interventions, such as gingivoplasty, are reserved for specific conditions like certain forms of gingival enlargement, not for initial management of plaque-induced gingivitis.

7. (B) Flossing combined with appropriate toothbrushing technique

Effective plaque control via mechanical cleaning remains the cornerstone of gingivitis prevention and management. Daily brushing with a proper technique and consistent flossing targets plaque at and below the gingival margin, thereby reducing inflammation. While fluoride mouthwash supports remineralization and overall oral health, it is less critical than mechanical plaque removal for preventing gingivitis progression. Green tea consumption may offer some anti-inflammatory benefits but does not replace the necessity of mechanical plaque control. Interdental brushes are beneficial, yet weekly usage is insufficient for managing gingival health compared to more frequent flossing.

8. (C) Attachment loss and periodontal pocket formation

Gingivitis is confined to the gingival tissues and is characterized by inflammation without destructive changes to the connective tissue attachment and bone. The transition to periodontitis occurs when there is apical migration of the junctional epithelium, resulting in true periodontal pocket formation and loss of alveolar bone and ligament attachment. Collagen fiber disorganization can occur even in gingivitis but, by itself, does not define periodontitis. Ulceration of the epithelium can be seen in necrotizing gingival conditions. Redness extending to alveolar mucosa may reflect severe inflammation but not necessarily periodontitis.

9. (C) Push the bristles forcefully until slight tissue bleeding occurs

An effective brushing technique for gingivitis management emphasizes gentle but thorough plaque removal along the gingival margin. A 45-degree angle helps the bristles reach the sulcus area. Circular or vibratory methods effectively loosen plaque. Brushing occlusal surfaces in a back-and-forth motion effectively cleans pits and fissures. However, instructing a patient to apply enough force to cause bleeding could traumatize the tissues and worsen gingival inflammation. Proper technique balances pressure and thoroughness, preventing unnecessary damage while ensuring plaque removal. Bleeding during brushing typically signals inflammation, not a desired outcome.

10. (C) Plaque biofilm harbors bacteria and endotoxins that trigger inflammatory reactions

Poor oral hygiene allows bacterial plaque to accumulate, especially along the gingival margin. This biofilm includes numerous pathogenic microorganisms that release endotoxins and enzymes, causing local tissue damage. The gingiva then responds with an inflammatory reaction characterized by swelling, redness, and bleeding. Calculus formation can further irritate the gingiva but is not the fundamental cause; it forms due to mineralized plaque. Excessive saliva is more commonly protective than harmful, and clotting factors are not the key instigator in typical plaque-induced gingival disease. Therefore, bacterial colonization is the main cause.

11. (B) Chronic gingivitis

The patient's painless bleeding gums, generalized erythematous margins, and lack of attachment loss align with chronic gingivitis, which develops slowly over time. Smoking can mask gingival bleeding signs by reducing vascularity but does not preclude plaque-induced gingivitis. Necrotizing ulcerative gingivitis typically presents with severe pain, cratered papillae, and fetid odor. Periodontitis involves attachment loss, which is not noted here. Periodontal abscesses cause localized purulent infections associated with pain and swelling. Hence, the most consistent diagnosis, given the slow onset and inflammatory signs, is chronic gingivitis.

12. (B) Chronic marginal gingivitis

Bulbous, readily bleeding interdental papillae classically signify chronic marginal gingivitis, driven by plaque accumulation along the gingival margin. Localized periodontitis would entail deeper periodontal pocketing or bone loss. Gingival recession reveals more tooth surface but typically does not involve bulbous papillae. Pericoronitis centers on the gingival flap around a partially erupted tooth, often the mandibular third molar, resulting in localized inflammation. Therefore, the described clinical presentation most clearly indicates chronic marginal gingivitis, typically managed with meticulous plaque control and professional interventions.

13. (C) Supragingival and subgingival scaling combined with oral hygiene instruction

The standard first-line approach for chronic gingivitis involves removing accumulated plaque and calculus via thorough scaling (both supragingival and subgingival), combined with proper oral hygiene education. This dual strategy addresses the etiologic factors and empowers the patient to maintain healthy gingiva. Gingivectomy is typically reserved for pathological overgrowth or other specific conditions. Topical corticosteroids are not routinely employed for generalized plaque-induced gingivitis. Extraction of affected teeth is a last resort for teeth with severe, non-restorable periodontal or structural problems, not for manageable gingivitis cases.

14. (B) Every 3 to 4 months

Standard protocols recommend a maintenance schedule of professional prophylaxis approximately every 3 to 4 months for patients with a history of gingivitis, even when stable. This interval helps remove any accumulated plaque or calculus and reinforces oral hygiene instructions before inflammatory changes become advanced. Professional cleanings at intervals longer than 6 months often allow recurrence of gingival inflammation, especially if the patient's home care is inconsistent. A 2-week interval is unnecessarily frequent for most stable cases, and waiting until symptoms arise may allow minor gingivitis to progress into more severe disease.

15. (C) Spontaneous bleeding with minimal plaque

In the absence of significant plaque accumulation, spontaneous bleeding suggests that an additional factor beyond local irritation may be contributing to the gingival inflammation. Conditions like hematologic disorders (e.g., leukemia) or vitamin deficiencies can present as unexplained gingival bleeding. Localized redness confined to one tooth is commonly linked to localized plaque or trauma, and mild edema that responds to improved oral hygiene is characteristic of routine gingivitis. A lightly shaped gingival margin simply indicates normal anatomic contour. Therefore, spontaneous bleeding with minimal plaque is a red flag for systemic issues.

16. (A) Both A and R are true, and R is the correct explanation for A

Chronic gingivitis can remain localized to the gingival margin and persist for long durations without destroying periodontal ligaments or alveolar bone. For periodontitis to occur, bacteria and their byproducts must breach the junctional epithelium and infiltrate the deeper supporting structures, setting off collagen breakdown and bone resorption. Thus, gingivitis may remain stable if adequately managed or if host responses keep it contained. The reason directly explains why not all gingivitis progresses to periodontitis: the inflammatory process needs to advance deeper into supporting tissues, which might never occur in well-controlled cases.

17. (C) Regular periodontal check-ups and reinforcement of plaque control measures

Maintenance of gingival health post-treatment relies heavily on consistent plaque control, which includes effective brushing, flossing, and other interdental cleaning methods. Regular periodontal check-ups allow for early detection of plaque buildup and address emerging inflammatory changes before they progress. Prescription antimicrobials are not generally required for routine maintenance unless specific conditions are diagnosed. Although saline rinses can soothe irritated tissues, they do not replace comprehensive mechanical debridement. Genetic testing for susceptibility to periodontal disease is not standard practice for maintenance in chronic gingivitis cases.

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18. (C) Assessing sulcus depth with a periodontal probe

Periodontal probing is the key investigative procedure to detect the presence of attachment loss or pocket formation, which are hallmarks of periodontitis. Gingivitis typically presents with normal or slightly increased sulcus depths due to swelling, but without attachment loss. Checking tooth mobility is more indicative of advanced periodontal destruction. Measuring the plaque index can reflect hygiene status but does not differentiate between gingivitis and periodontitis. Vitality tests are used to assess the pulp health of teeth, which is not directly relevant in differentiating gingivitis from periodontitis.

19. (C) Bacterial plaque accumulation

The most common initiator of gingival inflammation, particularly when localized and of short duration, is bacterial plaque. Plaque harbors pathogens that generate inflammatory mediators, leading to bleeding and discomfort. While genetic predisposition, medications (e.g., cyclosporine, nifedipine, phenytoin), and autoimmune factors can contribute to gingival changes, these are less frequent causes of localized acute gingival inflammation. The scenario describes classic plaque-induced gingivitis that emerges from poor oral hygiene or inadequate plaque removal. Prompt intervention includes professional cleaning and improved patient compliance with daily hygiene.

20. (B) Smoking cessation advice and improved plaque control

Smoking impairs gingival blood flow, reducing apparent bleeding and masking disease activity. This condition persists as chronic inflammation despite its muted clinical presentation. The essential initial step involves integrating smoking cessation strategies into a comprehensive plaque control regimen. Professional debridement and patient education on brushing, flossing, and optional chemotherapeutic mouth rinses form the backbone of prevention. Antibiotics are typically reserved for acute periodontal infections or aggressive forms. Surgical interventions, such as gingivoplasty or pocket reduction, are indicated after stabilizing the condition non-surgically. Hence, behavioral modification and mechanical debridement come first.

21. (C) The tissue undergoes reparative fibrosis in response to longstanding low-grade inflammation

In chronic gingivitis, inflammatory processes persist, causing fluctuating periods of damage and repair. Over time, fibroblasts may deposit excessive collagen in the connective tissue, creating a fibrotic or firm appearance. This differs from the early edema seen in acute inflammation, where vascular permeability and fluid accumulation cause swollen, soft gingiva. The fibrotic change is the body's attempt to stabilize an ongoing low-grade inflammation. Local anesthetic infiltration has no lasting effect on gingival texture, and the presence of continuous collagen breakdown without repair typically causes further deterioration, not fibrosis.

22. (C) A painful, ulcerative gingival condition often associated with fusiform bacteria and spirochetes

ANUG, also referred to as necrotizing ulcerative gingivitis, is an acute condition characterized by painful ulceration, necrosis of gingival papillae, and bleeding. Fusiform bacteria and spirochetes have been traditionally implicated as potential etiological factors. The condition is associated with poor oral hygiene, stress, and immunocompromised states. It differs from chronic, painless fibrotic swellings and from viral infections that create vesicular lesions (e.g., herpetic gingivostomatitis). Mechanical trauma leading to recession does not typically result in ulceration or necrosis. Hence, ANUG is distinctly painful, necrotic, and ulcerative.

23. (B) Anticonvulsants

Phenytoin, a well-known anticonvulsant, is notably associated with gingival overgrowth. Other medication categories, such as calcium channel blockers (e.g., nifedipine, amlodipine) and immunosuppressants (e.g., cyclosporine), can also cause gingival enlargement. Antibiotics, narcotic analgesics, and proton pump inhibitors are not commonly linked to significant gingival hyperplasia. Although the exact mechanism involves altered fibroblast function and collagen metabolism, clinical management often requires frequent dental cleanings, meticulous oral hygiene, and sometimes surgical recontouring.

Careful collaboration between dental and medical professionals is crucial to balance seizure control and oral health considerations.

24. (A) Plaque biofilm stimulates fibroblasts to deposit excess collagen

In chronic plaque-induced inflammation, bacterial antigens and inflammatory mediators can stimulate fibroblast proliferation and collagen deposition within the gingival connective tissues. This leads to an overgrowth or enlargement of the gingiva. Circulating antibodies generally help modulate inflammatory responses, but they do not promote tissue atrophy in gingivitis. Calculus can contribute to irritation but does not mechanically compress tissues enough to cause hypertrophy. Cholesterol crystals are not typically deposited in the gingival sulcus. Thus, the persistent inflammatory milieu around plaque is the primary catalyst for fibrotic changes and resultant overgrowth.

25. (B) Rapid onset of bleeding necrotic ulcerations

Drug-induced gingival enlargement typically appears as fibrotic or nodular overgrowth of the gingiva, especially in the interdental papillae, and can encroach upon tooth crowns, complicating oral hygiene. However, these medications, such as certain anticonvulsants, calcium channel blockers, and immunosuppressants, do not typically trigger sudden necrotic ulcerations. Rapid ulcerative lesions align more with necrotizing periodontal conditions or other acute infections. Therefore, the hallmark signs of drug-induced enlargement are chronic fibrotic changes rather than rapid necrosis and ulceration. Early recognition allows adjustments in medication and improved plaque control measures.

26. (C) Hereditary fibromatosis is genetically determined and can appear in the absence of external triggers

Hereditary gingival fibromatosis manifests through a genetic predisposition leading to progressive gingival overgrowth without the need for medication or systemic stimuli. Conversely, medication-induced enlargement arises from specific pharmacological triggers (anticonvulsants, immunosuppressants, calcium channel blockers). Although stopping the causative drug can reduce medication-induced gingival overgrowth, this resolution is not always complete or spontaneous, especially if fibrosis has advanced. Both medication-induced and hereditary fibromatosis primarily affect the collagenous connective tissue. The epithelium may adapt secondarily in either form, but the root cause in hereditary fibromatosis is genetic.

27. (B) Supragingival scaling, root planing, and strict oral hygiene reinforcement

Chronic inflammatory gingival enlargement primarily stems from plaque-induced inflammation. The cornerstone of treatment is mechanical debridement—removal of plaque and calculus through scaling and root planing—accompanied by rigorous instruction in plaque control for the patient. Antibiotics are not indicated unless there is a superimposed acute infection or systemic complications. Extraction of affected teeth is a last resort for severely compromised periodontal conditions. Surgical intervention (e.g., gingivectomy) may be necessary for severe cases but generally follows thorough debridement and improvement in oral hygiene to limit recurrence post-surgery.

28. (B) Liaising with the physician to consider an alternative drug

Certain calcium channel blockers, including amlodipine, can cause gingival enlargement. If clinically significant overgrowth occurs, the dentist should communicate with the patient's physician to discuss alternative antihypertensive medications less likely to provoke this response (e.g., ACE inhibitors or ARBs, if medically appropriate). Stopping antihypertensive therapy without medical oversight may jeopardize blood pressure control, and switching to insulin is relevant to diabetic management, not hypertension. While surgical recontouring might be necessary for severe, persistent overgrowth, it should come after addressing the causative medication and optimizing plaque control.

29. (C) Perform gingivoplasty or gingivectomy

Persistent gingival overgrowth after meticulous plaque control and nonsurgical therapy (scaling, root planing, and improved home care) may require surgical intervention. Gingivoplasty or gingivectomy helps remove excessive tissue to

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restore normal gingival contours, allowing patients better access for hygiene. Antibiotics are generally reserved for acute infections or specific conditions, not chronic fibrotic overgrowth without active infection. Extraction of teeth is not indicated if the dentition is restorable and the problem lies primarily in enlarged gingiva. While mouth rinses can supplement care, they rarely suffice when overgrowth is advanced.

30. (C) Firm, resilient texture with a pale pink color

Fibrotic gingival enlargement often presents with a dense, firm consistency due to excess collagen deposition. This makes the tissue appear more resilient and sometimes paler compared to inflamed, edematous gingiva. Edematous gingival enlargement typically exhibits a reddish, spongy consistency that bleeds easily due to increased vascular permeability and inflammatory cell infiltration. A bluish discoloration of gingival margins is not a hallmark of fibrotic changes; it can be associated with chronic venous congestion or certain pigments. Recognizing fibrotic traits helps differentiate longstanding gingival conditions from acute inflammatory presentations.

31. (A) Scaling and root planing

Cyclosporine-induced gingival enlargement often worsens with poor oral hygiene. Scaling and root planing, combined with meticulous plaque control, forms the first-line response to limit further inflammatory changes. Collaboration with the prescribing physician may be considered for a potential dose adjustment or medication change, but abrupt modifications risk transplant complications. Surgical recontouring is usually deferred until after nonsurgical management is optimized. Topical steroids do not routinely reverse medication-induced overgrowth. Maintaining a clean oral environment is crucial to reducing the severity of drug-induced gingival enlargement and improving patient comfort.

32. (B) Tissue swelling extends coronally, creating deeper sulci

When gingival tissues enlarge coronally because of chronic inflammation or fibrotic overgrowth, the gingival margin moves higher on the tooth surface, effectively increasing the probing depth. However, there is no true attachment loss, and the alveolar bone remains intact. This phenomenon is termed a pseudopocket because the increased depth is not due to actual apical migration of the junctional epithelium. The periodontal ligament generally does not thicken enough to cause such displacement. True pockets involve bone loss and are characteristic of periodontitis rather than simple gingival enlargement.

33. (C) Pericoronitis

Pericoronitis refers to inflammation of the soft tissue operculum over a partially erupted tooth, typically a mandibular third molar. The presentation often includes localized swelling, pain, and occasional purulent discharge. Simple gingivitis typically affects the gingival margin more diffusely, and a periodontal abscess is a localized accumulation of pus within the supporting periodontal structures. Necrotizing ulcerative periodontitis involves extensive tissue necrosis, severe pain, and deeper periodontal destruction, not limited to the operculum. Therefore, inflamed tissues overlying an erupting third molar are consistent with pericoronitis.

34. (B) Pericoronitis

Pericoronitis is inflammation of the operculum—a flap of gum tissue that can partially cover an erupting third molar. Patients typically describe localized pain, occasional bleeding, and food trapping beneath this flap. Although mild, these symptoms can escalate if infection or trauma persists. Periodontitis around a third molar would require attachment loss and pocket formation in that area. Periodontal abscess is typically more acute, characterized by significant swelling and pus formation. Drug-induced gingival overgrowth has a more generalized fibrotic presentation, unrelated specifically to the eruption process of a third molar.

35. (C) Irrigation under the operculum and improved oral hygiene

In acute pericoronitis, initial treatment focuses on managing localized infection and inflammation. Gently irrigating beneath the operculum to remove debris and bacteria is key, followed by thorough oral hygiene instructions. If necessary, the clinician may prescribe antibiotics in the presence of systemic involvement (e.g., fever, lymphadenopathy).

Extraction of the partially erupted tooth or a definitive gingivectomy may be considered later if recurrent pericoronitis persists or space is insufficient. However, immediate aggressive surgical interventions are typically not the first step unless the situation is critical or complicated by severe infection.

36. (B) Recurrent pericoronitis episodes despite conservative therapy

Operculectomy—surgically removing the gingival flap over the partially erupted tooth—becomes a viable option when a patient experiences repeated bouts of inflammation and infection (i.e., recurrent pericoronitis) that do not resolve with standard conservative measures (irrigation, oral hygiene improvement, occasional antibiotics). For mild or first-time events, conservative management generally suffices, and asymptomatic opercula without prior infections typically do not require surgical intervention. This guideline ensures that surgery is reserved for scenarios in which the operculum's chronic irritation, plaque entrapment, or repeated inflammation significantly impacts the patient's oral health.

37. (B) Ludwig's Angina

Severe facial swelling and systemic signs like fever suggest that an infection arising from pericoronitis or other odontogenic sources may have spread into fascial spaces. Ludwig's Angina is a potentially life-threatening cellulitis of the submandibular space that requires urgent management to prevent airway compromise. Sinusitis typically manifests with nasal congestion or sinus-specific discomfort. Periodontal cyst formation leads to a localized radiolucent lesion but does not typically cause diffuse swelling or systemic effects in the acute phase. Oral lichen planus is a chronic mucocutaneous condition that does not present with acute swelling and fever.

38. (B) Localized pain around a partially erupted tooth

Pericoronitis is localized inflammation related to the operculum over a partially erupted tooth, frequently a lower third molar. Patients typically report localized pain that may radiate to the ear or throat, alongside possible swelling. Conversely, generalized gingivitis tends to manifest as more uniform signs of bleeding, redness, and swelling around multiple teeth without specifically localized pain. Fibrotic enlargement and malodor can accompany chronic gingival or periodontal conditions, but the hallmark feature distinguishing pericoronitis remains the localized pain and operculum involvement in the area of eruption.

39. (A) Both A and R are true, and R is the correct explanation of A

When pericoronitis persists, the local inflammation in that distal region of a molar can compromise periodontal support, leading to pocket formation and potential bone loss. The reason is indeed that chronic inflammatory processes release mediators degrading connective tissues and alveolar bone. Thus, repeated or unresolved pericoronitis episodes can create an environment conducive to periodontal breakdown. The reason directly clarifies how persistent inflammation causes tissue destruction and explains why chronic pericoronitis correlates with the development of distal periodontal pockets around partially erupted teeth.

40. (B) Extraction of the involved tooth if non-functional or poorly positioned

When standard treatments—irrigation, antibiotics (if indicated), and improved hygiene—prove ineffective, and the third molar is either non-functional or malpositioned with a poor eruption path, extraction becomes a necessary definitive solution. This removes the source of recurrent inflammation and infection. Mandibular nerve resection is not a standard management technique for pericoronitis. Bed rest and analgesics alone merely address symptoms without eliminating the causative issue. Muscle relaxants may help if trismus is present but do not address the primary pathology. Extraction aims to end chronic episodes and reduce the risk of complications.

41. (D) Panoramic radiograph (Orthopantomogram)

A panoramic radiograph (OPG) provides a broad view of the jaws, allowing assessment of the third molar's angulation, eruption status, and relationship to vital structures. This information is crucial to determining whether a tooth is impacted or poorly aligned, which can predispose to recurrent pericoronitis. Bitewings mainly evaluate interproximal caries and alveolar bone levels in

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posterior teeth. Periapical films can be helpful for localized details but generally do not visualize the entire arch structure. Occlusal radiographs are more limited in diagnosing lower third molar positioning, making an OPG the best option.

42. (B) Gentle irrigation of the operculum area

When pericoronitis presents with localized inflammation, mild trismus, and no systemic involvement, the immediate goal is to reduce the bacterial load and promote drainage. Gentle irrigation, cleaning the operculum area, and facilitating improved oral hygiene are crucial first steps. Systemic medications like high-dose corticosteroids are typically not indicated unless a specific severe condition requires them. Full mouth prophylaxis is beneficial in a broader periodontal context but does not specifically address the acute pericoronitis area. Surgical extraction might be considered if conservative measures fail or if the tooth's position is non-restorable.

43. (C) Extraction of the impacted third molar

A mesioangular impacted third molar with recurrent pericoronitis is unlikely to fully erupt into a functional position. Repeated infections indicate that non-surgical approaches are insufficient. Extraction removes the source of chronic inflammation and eliminates the operculum. Gingivoplasty alone may offer temporary relief but will not address the malposition. Antibiotic prophylaxis does not resolve the root cause and risks contributing to antibiotic resistance. Thus, removal of the offending tooth is the definitive management for persistent pericoronitis in a tooth with poor eruption potential, improving the patient's long-term oral health.

44. (B) T-cell dominated cellular response with cytokine release

In plaque-induced gingivitis, the immune response often involves T lymphocytes as a major component, which release cytokines that recruit additional inflammatory cells and mediate tissue changes. This inflammatory cascade leads to redness, swelling, and bleeding of gingival tissues. While B cells also participate, T-cell driven immunity is especially prominent in early lesions of gingivitis. IgE-mediated hypersensitivity is more closely associated with allergic reactions. Autoimmune processes targeting fibroblasts are not typical of simple gingivitis. Complement activation generally occurs in concert with the bacterial biofilm, rather than spontaneously in its absence.

45. (B) Gingivitis

Gingivitis is an inflammatory condition affecting only the gingiva, without any irreversible destruction of the alveolar bone or the periodontal ligament. It can be reversed through improved oral hygiene and professional prophylaxis if addressed early. Periodontitis involves attachment loss, alveolar bone resorption, and pocket formation. A periodontal abscess is a localized collection of pus within the periodontal tissues. Papillitis refers to localized inflammation of the interdental papilla but doesn't necessarily describe an overall gingival condition. Therefore, gingivitis specifically denotes inflammation confined to the gingival tissue without deeper structural loss.

46. (C) Gingival Index (Löe and Silness)

The Gingival Index devised by Löe and Silness is a commonly employed clinical measure to assess gingival inflammation based on color, consistency, and bleeding on probing. The DMFT index (Decayed, Missing, Filled Teeth) gauges dental caries experience, whereas the Simplified Oral Hygiene Index evaluates plaque and calculus levels. Russell's Periodontal Index provides a broader assessment of periodontal disease status, including bone loss, but is less frequently used in modern practice for gingival inflammation alone. Thus, the Gingival Index remains a standard tool for quantifying gingival condition.

47. (C) Non-plaque-induced lesions may need different treatment approaches, such as systemic therapy

Whereas plaque-induced gingivitis can often be managed with improved oral hygiene and professional debridement, non-plaque-induced gingival conditions may stem from viral, fungal, or autoimmune etiologies (e.g., herpetic gingivostomatitis, mucocutaneous diseases). These frequently require specific systemic or targeted treatments beyond mechanical plaque control. Distinguishing the etiology ensures proper interventions. Plaque-induced gingivitis, by contrast, commonly responds well to scaling, root

planing, and patient education. Non-plaque-induced lesions are not necessarily more common, and tooth extraction is not usually indicated for routine plaque-induced gingivitis.

48. (C) Hypertension without medication

Systemic risk factors that can exacerbate plaque-induced gingivitis include uncontrolled diabetes, hormonal fluctuations (such as puberty and pregnancy), stress, and smoking. These factors compromise host immunity and/or influence tissue responses, making the gingiva more susceptible to plaque-related inflammation. Hypertension alone, in the absence of a medication known to affect gingival tissues (like certain calcium channel blockers), does not typically exacerbate plaque-induced gingivitis. However, if a patient takes a gingival overgrowth–inducing antihypertensive, that may alter the periodontal condition. Hence, untreated hypertension itself is not a recognized direct risk factor.

49. (B) Hormonal gingivitis exhibits more pronounced inflammation with minimal plaque

Hormonal changes during pregnancy or puberty can heighten the gingival response to plaque, resulting in more extensive inflammation, edema, and bleeding, even if the plaque levels are relatively low. Chronic plaque-induced gingivitis usually correlates more closely with plaque quantity: the more plaque present, the more pronounced the inflammation. Though the hormonal environment magnifies gingival reactions, plaque bacteria remain the primary etiologic factor. Hormonal gingivitis does not cause bone loss, a sign of periodontitis. Similarly, plaque-induced gingivitis typically involves bleeding when inflammation is significant.

50. (B) Instruct thorough plaque control and consider more frequent dental cleanings

Pregnancy gingivitis arises partly due to elevated hormone levels that enhance gingival vascularity and inflammatory responses. Even with diligent oral hygiene, some patients experience exaggerated gingival inflammation. More frequent professional prophylaxis—every 2 to 3 months—and emphasizing meticulous home care often control symptoms effectively. Antibiotics are generally not indicated unless there is an active infection. Surgical excision may be reserved for pregnancy tumor (pyogenic granuloma) or severe cases that do not resolve with conservative measures. Avoiding all dental care until postpartum can allow minor inflammation to progress significantly.

51. (B) Rapid attachment loss and bone destruction in clinically healthy patients

Aggressive periodontitis is a distinct type of periodontal disease that typically exhibits rapid progression of attachment loss and alveolar bone destruction in patients who are otherwise systemically healthy. Such patients often present minimal amounts of plaque relative to the severity of periodontal breakdown, emphasizing a potentially robust host response or distinctive bacterial profile. The disease usually has familial aggregation, suggesting a genetic component. Unlike chronic periodontitis, aggressive forms have an earlier onset and more severe, rapid destruction. Correctly identifying its aggressive nature is crucial to prevent significant tooth loss through timely and targeted intervention.

52. (C) Aggregatibacter actinomycetemcomitans

Aggregatibacter actinomycetemcomitans (A.a) frequently appears in patients with aggressive periodontitis and is well-known for its virulence factors, including leukotoxin, which can destroy host immune cells. Although P. gingivalis is a key pathogen in various forms of periodontitis, A.a is notably linked to aggressive presentations, especially localized aggressive periodontitis. Treponema denticola is often implicated in necrotizing periodontal diseases, while Fusobacterium nucleatum serves as a bridging organism in plaque biofilms. Identifying A.a in subgingival samples highlights the need for targeted antimicrobial interventions and meticulous mechanical debridement to prevent rapid periodontal destruction.

53. (C) A heightened immune-inflammatory response occurs in genetically predisposed individuals

Aggressive periodontitis is marked by a disproportionate immune-inflammatory reaction, often driven by underlying genetic factors. In these patients, even relatively small amounts of plaque can trigger a strong host response, leading

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to pronounced collagen breakdown and alveolar bone loss. This heightened immunologic activity stems from dysfunctional neutrophil chemotaxis or macrophage hyper-responsiveness, among other mechanisms. Because the local tissues are unable to contain the bacterial challenge effectively, structural destruction progresses faster than in chronic periodontitis. Understanding this interplay of bacterial virulence and host susceptibility is crucial for proper diagnosis and early, aggressive management.

54. (C) High amounts of visible plaque in all affected sites

Localized aggressive periodontitis typically features severe, rapid attachment loss around permanent first molars and incisors, often presenting around puberty. Affected sites may show striking bone loss despite limited or even negligible visible plaque accumulations, suggesting a pronounced host response or bacterial specificity rather than generalized poor hygiene. Familial clustering suggests a genetic predisposition. In contrast, chronic periodontitis correlates more directly with heavy plaque loads over time. Therefore, the exception among the listed features is the presence of high visible plaque in all affected sites, which is not usually characteristic of localized aggressive periodontitis.

55. (C) Generalized form involves at least three permanent teeth other than first molars and incisors

Aggressive periodontitis is divided into "localized" and "generalized" forms based on the distribution of affected teeth and clinical pattern. Localized aggressive periodontitis typically presents with severe attachment loss around the first molars and incisors, often with onset around puberty. In contrast, generalized aggressive periodontitis affects at least three permanent teeth aside from the first molars and incisors, typically manifesting in patients under 30 years old but not strictly limited to that age group. Familial trends can occur in both types. Identifying these patterns guides proper diagnosis, treatment planning, and potential screening of family members.

56. (C) Local or systemic antimicrobial therapy after debridement

While nonsurgical mechanical therapy (thorough scaling and root planing) remains central to managing localized aggressive periodontitis, clinicians frequently supplement it with antimicrobial treatments. The use of antibiotics such as amoxicillin plus metronidazole, or local drug delivery agents, has been shown to significantly reduce pathogenic bacteria like Aggregatibacter actinomycetemcomitans. Corticosteroids are not standard for routine periodontal therapy. Extraction of multiple teeth is unnecessarily aggressive unless the prognosis is poor. Gingivoplasty addresses gingival contour but does not control underlying microbial or inflammatory etiologies. Combining effective debridement with targeted antimicrobials achieves the most reliable outcomes.

57. (A) Systemic antibiotic therapy in combination with root planing

The scenario strongly suggests localized aggressive periodontitis, given the patient's age, pattern of bone loss, and limited plaque despite severe destruction. Although thorough scaling and root planing are vital, aggressive periodontitis typically requires an adjunct antimicrobial approach due to the presence of specific, highly virulent pathogens like Aggregatibacter actinomycetemcomitans. Combining mechanical debridement with systemic antibiotics (for example, a course of amoxicillin and metronidazole) significantly increases the likelihood of controlling the infection and slowing disease progression. Fluoride or antiseptic rinses alone do not adequately address aggressive lesions, and gingivectomy is not indicated in this scenario.

58. (B) Rapid vertical bone loss around permanent first molars

Localized aggressive periodontitis often manifests as rapid, localized vertical bone loss around first molars (and usually incisors) in relatively young patients. This pattern, along with minimal plaque or calculus, points toward an abnormal host response or presence of specific aggressive pathogens. Diffuse gingival redness without radiographic changes aligns more with gingivitis. Widespread calculus deposits and mild recession typically reflect chronic periodontal problems, and generalized bleeding with minimal bone loss is not consistent with the severe, rapid breakdown in localized aggressive periodontitis. Early recognition enables

prompt antimicrobial treatment and mechanical debridement to preserve tooth support.

59. (D) Relying solely on thorough home brushing to halt rapid bone loss

Aggressive periodontitis presents with rapid tissue destruction out of proportion to visible plaque levels, necessitating a multifaceted approach. Home care is crucial but rarely sufficient on its own to control the highly virulent microbial challenge and address the patient's heightened inflammatory response. Adjunct systemic antibiotics, frequent maintenance intervals, and potential use of microbial testing help tailor therapy to the specific pathogens involved. By contrast, simply improving brushing will not typically halt the swift alveolar bone loss. Appropriate professional intervention is key, including detailed debridement, antimicrobial therapy, and close monitoring of disease activity.

60. (C) Dysregulated host defense leads to excessive inflammation and collagen breakdown

Aggressive periodontitis is characterized by a hyperreactive or dysfunctional immune system, resulting in a potent inflammatory cascade and rapid tissue destruction. Despite relatively low levels of plaque, pathologic bacteria such as Aggregatibacter actinomycetemcomitans can provoke substantial releases of cytokines and proteolytic enzymes. These mediators degrade collagen fibers in the periodontal ligament and accelerate alveolar bone resorption well beyond what is typically observed in age-matched individuals with chronic periodontitis. Calculus presence or alveolar bone density alone does not explain the aggressive breakdown. Instead, a genetically influenced, aberrant immune response drives this swift tissue loss.

61. (B) Localized aggressive periodontitis

This adolescent's presentation—rapid bone loss with mobility in first molars, minimal plaque, and a maternal history—illustrates the classic presentation of localized aggressive periodontitis. Genetic influences often play a role, and the disease can quickly compromise supporting tissues if left untreated. Chronic periodontitis typically arises in older adults and correlates more strongly with plaque accumulation. Necrotizing ulcerative periodontitis presents with necrosis of papillae and severe pain, which is not described here. Simple gingivitis, though common, does not account for the dramatic vertical bony defects or tooth mobility so early in life.

62. (B) Generalized aggressive periodontitis

Generalized aggressive periodontitis typically affects individuals under 30 years old, involving at least three permanent teeth other than the first molars and incisors. Rapid bone destruction with minimal plaque accumulation suggests an exaggerated or atypical host response, consistent with aggressive forms of periodontal disease. Localized aggressive periodontitis usually is confined to first molars and incisors, while chronic marginal gingivitis does not generally cause severe alveolar bone loss. Pericoronitis targets operculum tissues around partially erupted teeth, not widespread sites. Thus, generalized aggressive periodontitis aligns best with the presentation of multiple quickly deteriorating sites.

63. (B) Periodontal maintenance every 2-3 months

Following initial therapy—comprehensive scaling and potential adjunct antimicrobial treatments—regular periodontal maintenance visits are vital, typically every 2-3 months. Aggressive periodontitis can rapidly recur if bacterial colonization is not rigorously controlled. These visits allow monitoring of probing depths, reviewing oral hygiene, performing localized debridement if needed, and reinforcing home care techniques. Root amputation or extraction may be necessary in specific hopeless scenarios, but not routinely done for all multi-rooted or posterior teeth. Dietary changes to liquid forms are not standard. Therefore, diligent supportive care to detect and control recurrence is paramount.

64. (B) Genetic counseling or screening for siblings and close relatives

Localized aggressive periodontitis often exhibits familial aggregation, suggesting a hereditary predisposition. The presence of such a case may warrant screening of siblings or close relatives for early signs of bone loss or unusual periodontal breakdown, even if they exhibit minimal plaque. Genetic counseling or at least a dental evaluation can help identify risk factors and enable early intervention. Extracting family members' healthy

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first molars is not a recognized preventive strategy. Changing utensils or diets does not address the primary pathogenic or genetic components. Early recognition and monitoring remain the most effective preventive measures.

65. (C) Papillon-Lefèvre syndrome

Papillon-Lefèvre syndrome is a rare genetic disorder involving palmoplantar keratosis and severe periodontitis, often accompanied by immune or neutrophil dysfunction. Patients can experience recurrent skin and soft-tissue infections, pointing to systemic involvement beyond local factors in the mouth. Chronic stress or pregnancy gingivitis can exacerbate periodontal issues but would not typically cause recurrent systemic infections. Local tissue trauma does not explain systemic or skin manifestations. Thus, in patients with aggressive periodontitis and frequent infections or characteristic skin lesions, Papillon-Lefèvre syndrome should be ruled out. Early identification can facilitate targeted medical and dental management.

66. (A) Both A and R are true, and R explains A

Aggressive periodontitis has a well-documented genetic component, which explains its tendency to appear within families. Specific inherited immune dysfunctions—like neutrophil chemotaxis defects—allow aggressive periodontal pathogens to proliferate and trigger rapid alveolar bone destruction. Therefore, the familial clustering is not coincidental but linked to a shared genetic risk. Both the assertion and the reason align with clinical observations that relatives of a patient with aggressive periodontitis frequently require screening for early intervention. The reason directly elucidates the mechanism behind the assertion, making (A) the correct response.

67. (C) Surgical debridement and bone grafting in severe defects

If nonsurgical periodontal therapy (scaling, root planing) and adjunct antimicrobials fail to halt progression, localized aggressive periodontitis can lead to extensive bony defects around affected teeth. In such cases, surgical intervention may be necessary to access deep pockets, remove residual calculus, and potentially regenerate lost bone using grafts or membranes. Corticosteroids are not standard for persistent aggressive periodontitis, and full-arch extractions are a last resort if teeth are hopeless. While topical fluorides help protect against caries, they do not significantly influence deep periodontal defects. Surgical procedures can help restore lost support if the teeth remain salvageable.

68. (C) Microbial culture or polymerase chain reaction (PCR) analysis

Aggressive periodontitis often involves specific bacterial species, most notably Aggregatibacter actinomycetemcomitans. Targeted microbial analysis—via culture or PCR—provides direct evidence of these pathogens. Such diagnostic tools guide tailored antibiotic regimens and measure the effectiveness of therapy. Salivary flow tests evaluate saliva quantity and composition but are less useful for identifying pathogens. CBCT offers three-dimensional imaging of bone and tooth structures but does not reveal microbial specifics. While diabetes screening (serum glucose) is important in periodontal disease management, it does not specifically detect bacterial profiles. Therefore, microbial assays are pivotal for precise diagnosis and therapy.

69. (B) PCR for Aggregatibacter actinomycetemcomitans

A highly suspicious presentation of localized aggressive periodontitis features severe localized bone loss around anterior teeth, minimal plaque, and a familial tendency. PCR testing for Aggregatibacter actinomycetemcomitans helps verify its involvement, guiding targeted antibiotic therapy. Complete blood counts or lipid profiles may highlight systemic conditions but do not confirm the direct bacterial cause. Urinalysis checks renal or metabolic issues without pinpointing periodontal pathogens. By detecting specific microbial DNA, PCR identifies whether this bacterium is playing a key role in the disease. Early detection can significantly improve disease control and prognosis.

70. (B) Antimicrobial therapy with mechanical debridement

Localized aggressive periodontitis requires integrated mechanical debridement (scaling and root planing) combined with adjunct antibiotic regimens. Because patients can present genetically driven vulnerabilities and highly pathogenic

bacterial strains like A.a, mechanical cleaning alone rarely suffices. Systemic antimicrobials—often a combination of amoxicillin and metronidazole—significantly enhance bacterial eradication and clinical outcome. Additional steps may involve personalized instruction on plaque control, frequent maintenance, and careful family screening. Surgical interventions or splinting are occasionally needed if mobility persists. However, full-arch extraction or cosmetic gingivoplasty without addressing underlying microbial and host factors does not resolve the rapid disease progression.

71. (B) An acute infection causing painful, ulcerated papillae with a "cratered" appearance

Necrotizing ulcerative gingivitis (NUG) is a severe, acute condition characterized by necrosis of the interdental papillae, creating a cratered or "punched-out" look. Patients typically report intense pain, bleeding, and foul odor. Pathogens frequently implicated include fusiform bacteria and spirochetes, especially in individuals under stress or with compromised immune function. In contrast, medication-induced gingival overgrowth is generally painless and fibrotic rather than ulcerative. NUG does not spontaneously resolve without intervention; professional debridement, antimicrobial rinses, and supportive care are necessary to address the necrosis and prevent progression to necrotizing periodontitis.

72. (B) Prevotella intermedia

Necrotizing ulcerative gingivitis (NUG) frequently features high levels of anaerobic bacteria, including Prevotella intermedia and spirochetes such as Treponema. This polymicrobial consortium thrives under conditions of poor oral hygiene, stress, smoking, or immunosuppression. Aggregatibacter actinomycetemcomitans is most often associated with aggressive periodontitis, while Candida albicans is a fungus linked to oral candidiasis. Actinomyces israelii causes cervicofacial actinomycosis, not typically ulcerative gingivitis. Recognizing Prevotella intermedia's involvement helps clinicians select appropriate antimicrobial regimens and emphasize meticulous debridement to reduce the bacterial load and promote gingival healing.

73. (B) Tissue necrosis fosters the growth of anaerobic bacteria and spirochetes

Necrotizing ulcerative gingivitis involves necrotic breakdown of gingival tissue, creating deep ulcerations that harbor anaerobes and spirochetes. These microorganisms release sulfur-containing compounds and other volatile byproducts, resulting in a strong foul odor. The necrotic areas are extremely painful due to exposed nerve endings and extensive inflammatory infiltration. By contrast, autoimmune fibrotic conditions do not produce such necrosis or malodor. Bone deposition does not characterize this disease; in fact, necrotizing lesions may lead to tissue and potentially underlying bone destruction if it progresses. Hence, necrosis and anaerobic bacterial growth drive pain and odor.

74. (C) Fibrotic gingival overgrowth

NUG is an acute necrotic-inflammatory condition primarily involving interdental papillae that appear cratered or "punched-out." Patients present with severe pain, abundant bleeding, and noticeable halitosis due to necrotic tissue and bacterial byproducts. Fibrotic gingival overgrowth is absent; that phenomenon commonly appears in chronic inflammatory or drug-induced overgrowth scenarios, not an acute necrotizing infection. In NUG, the tissues are instead ulcerated and sloughing, rather than hyperplastic or fibrotic. Prompt management includes debridement of necrotic tissue, antimicrobial rinses, potential antibiotic therapy, and improved oral hygiene measures to control bacterial proliferation and encourage healing.

75. (B) NUP extends to deeper periodontal structures, causing attachment loss and bone necrosis

Necrotizing ulcerative gingivitis (NUG) typically affects the gingival tissues, creating painful, ulcerative lesions, but it generally does not extend beyond the superficial structures if treated promptly. When the necrosis progresses to include periodontal ligament and alveolar bone, it becomes necrotizing ulcerative periodontitis (NUP). This advanced condition causes attachment loss and possible necrosis of the underlying bone, leading to more severe symptoms and potential tooth mobility. NUP can also be associated with immunocompromised states. Neither form is painless, and both can occur

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in partially or fully dentate individuals. Proper diagnosis dictates targeted therapeutic strategies.

76. (B) Gentle debridement of necrotic areas, antimicrobial rinse, and pain management

Management of acute NUG starts with gentle debridement of necrotic tissue, reducing bacterial load and allowing healing. Antimicrobial mouth rinses, such as those containing chlorhexidine, help control pathogens, while analgesics or anti-inflammatory agents address pain. Antibiotics are prescribed if systemic involvement is evident (fever, lymphadenopathy) or the patient is immunocompromised, but mechanical and chemical plaque control is paramount. Full surgical excision of necrotic tissue is excessive in early care, and extracting teeth should be reserved for cases of irreversible destruction. Timely intervention often resolves NUG without drastic surgical measures.

77. (B) Use warm saline or chlorhexidine mouth rinses to reduce bacterial load

Necrotizing ulcerative gingivitis can flare up in stressful conditions, often accompanied by poor oral hygiene or lowered immune response. Professionally removing necrotic debris and thorough daily rinsing with warm saline or chlorhexidine solution helps disinfect the area, alleviating pain and controlling malodor. Continuing gentle toothbrushing is also key to preventing further plaque accumulation, contrary to avoiding brushing. A liquid diet may provide temporary relief but is not strictly required, while topical steroids are not a routine part of NUG treatment. Antimicrobial measures remain crucial for controlling bacterial overgrowth.

78. (C) Necrosis extending beyond gingiva into periodontal ligament and alveolar bone

NUG primarily involves the gingival margin and interdental papillae, resulting in superficial ulceration and necrosis. When necrotizing lesions extend deeper to involve the periodontal ligament and alveolar bone, the disease has progressed to necrotizing ulcerative periodontitis (NUP). This advanced stage causes increased attachment loss, possible bone sequestration, and tooth mobility if not aggressively treated. Pseudopockets arise from swelling in gingivitis, whereas fibrotic tissue suggests chronic inflammatory or drug-induced changes. Thus, identifying necrosis in deeper supporting structures is the hallmark sign indicating that NUG has transitioned into the more destructive NUP.

79. (C) Advising the patient to discontinue brushing to reduce irritation

Despite the pain associated with NUG, effective plaque control remains indispensable. Patients should continue gentle toothbrushing, carefully avoiding undue trauma to ulcerated tissues but still removing bacteria-laden plaque. Debridement of necrotic tissue and pseudomembranes, along with chlorhexidine or other antimicrobial rinses, helps reduce pathogenic microbes and prevent further deterioration. Pain management via analgesics is appropriate, especially given the often intense discomfort. Instructing a patient to forgo brushing may worsen plaque accumulation, exacerbate inflammation, and delay recovery. Therefore, discontinuing brushing is counterproductive to successful NUG management.

80. (C) Compromised immune response and reduced self-care lead to bacterial overgrowth

High levels of stress can downregulate the immune system, decreasing the body's capacity to fight pathogenic microbes in the oral cavity. Concurrently, stressed individuals may neglect oral hygiene or have poor nutrition, creating an environment favorable for spirochetes and fusiform bacteria associated with necrotizing ulcerative gingivitis (NUG). The result is a cascade of necrosis in the interdental papillae, severe pain, and malodor. Stress does not kill oral bacteria; rather, it lowers host defenses. Hypereruption or heightened salivary flow are unrelated to NUG's pathogenesis. Reduced host resistance under stress is the driving factor.

81. (B) Gentle removal of necrotic tissue

Necrotizing ulcerative gingivitis (NUG) commonly presents with cratered papillae, pseudomembranous slough, and intense pain. Immediate treatment entails gently removing necrotic and pseudomembranous debris to minimize bacterial reservoirs and promote healing. Chlorhexidine rinses and careful home hygiene instructions typically follow. Extractions and surgical procedures like gingivectomy or full-thickness flap operations are neither first-line nor

appropriate before controlling the acute infection. Addressing the necrosis early helps reduce discomfort, lower bacterial load, and prevent further tissue destruction or progression to necrotizing ulcerative periodontitis. Smoking cessation support may also enhance healing and long-term outcomes.

82. (B) Necrotizing ulcerative gingivitis (NUG)

Key clinical indicators of NUG include cratered interdental papillae covered by a grayish pseudomembrane, severe pain, profuse bleeding, and pronounced malodor. Patients often report sudden onset, and contributing factors may be stress, smoking, or immunosuppression. Chronic periodontitis tends to show progressive pocketing and attachment loss rather than acute ulceration. Pericoronitis is localized inflammation around a partially erupted tooth, typically a mandibular third molar. Medication-induced gingival overgrowth generally displays fibrotic, non-ulcerative tissue enlargement. NUG stands out by its necrotic lesions and characteristic symptoms, requiring prompt debridement and supportive antimicrobial therapy.

83. (B) Systemic antibiotics targeting anaerobes and spirochetes

When necrotizing ulcerative gingivitis becomes systemic—evidenced by fever, lymphadenopathy, or malaise—local therapies alone (debridement, topical antimicrobials) may be insufficient. Systemic antibiotics, such as metronidazole or amoxicillin-metronidazole combinations, help control the underlying microbial burden, particularly anaerobic and spirochetal populations. IV steroids are neither a common nor a first-line approach for NUG. Extracting all papillary-necrotic teeth is unwarranted unless the destruction is irreversible or advanced. Immediate gingivoplasty is inappropriate in the acute phase, as controlling the infection is paramount before cosmetic procedures. Combining local and systemic therapy optimally addresses advanced or systemic NUG.

84. (A) Reducing or quitting smoking

Smoking is a known risk factor for necrotizing ulcerative gingivitis, as it compromises vascular supply and impairs immune defenses in the gingival tissues. Advising cessation or at least reduction can dramatically improve treatment outcomes. Toothbrushing should not be discontinued; gentle plaque control is vital. Merely using mouthwash without removing necrotic debris and plaque is insufficient. A high-sugar diet does not promote gingival healing and may worsen oral health. Thus, behavior changes—especially related to smoking—and prompt mechanical and chemical control of the infection help restore gingival health in NUG patients.

85. (C) Mucormycosis or other deep fungal infection

In immunocompromised individuals (e.g., uncontrolled diabetes, HIV/AIDS, or those on immunosuppressive therapy), necrotic oral lesions can be caused by conditions beyond NUG. Deep fungal infections, such as mucormycosis, may present with rapidly progressing tissue necrosis and blackish discoloration. Though necrotizing ulcerative gingivitis remains a prime consideration, persistent or atypical necrotic lesions necessitate ruling out fungal or opportunistic infections. Aphthous ulcers are superficial and do not generally cause extensive necrosis. Simple gingival pigmentation changes or minor toothbrush injuries are less destructive. Thus, severe immunosuppression mandates a broader differential for necrotic intraoral lesions.

86. (C) "Punched-out" interdental papillae with pseudomembranous covering

NUG classically features necrosis and sloughing of the interdental papillae, creating a cratered or "punched-out" look. A grayish pseudomembrane of necrotic tissue often coats the surface. Patients frequently report intense pain, spontaneous bleeding, and foul odor. Pink or fibrotic gingiva, slight edema without ulceration, or deeply pocketed but minimally bleeding tissues are not indicative of NUG. While periodontitis may produce pocketing, the acute necrosis and pseudomembrane are more specific to NUG. Recognizing these signs is critical for initiating proper debridement, antimicrobial rinses, and supportive care, preventing progression to more advanced necrotizing disease.

87. (C) A is true, R is false

Necrotizing periodontal diseases, including NUG and NUP, can destroy gingival tissues and supporting structures in a short timeframe, especially in immunocompromised or highly stressed patients.

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However, poor oral hygiene alone does not account for every case; additional factors like compromised immunity, malnutrition, smoking, or acute stress frequently converge to trigger the necrotic lesions. Thus, the assertion that these diseases can cause rapid destruction is accurate, while the reason—claiming poor oral hygiene solely explains all necrotizing conditions—is incorrect. Instead, multifactorial risk factors significantly elevate susceptibility beyond just inadequate plaque control.

88. (B) Reinforcement of oral hygiene and removal of residual calculus

When NUG patients improve after initial debridement and antimicrobial care, subsequent visits focus on polishing and scaling residual deposits, re-evaluating tissue healing, and reinforcing oral hygiene instructions. Patients often require repeated motivation to maintain effective plaque control and possibly lifestyle modifications (e.g., reducing smoking). Surgical excision of papillae is not standard unless there is persistent, non-restorable tissue damage requiring contour correction. Routine antibiotic prophylaxis at every appointment is not indicated unless there are specific systemic factors. Postponing care for an extended period risks relapse or recurrence of the infection.

89. (C) Non-resolving necrotic lesions and unexplained weight loss

While necrotizing ulcerative gingivitis may cause dramatic local symptoms, it typically shows noticeable improvement once appropriate local therapy and supportive measures are provided. Failure to improve, especially coupled with systemic signs like unexplained weight loss, raises suspicion of an underlying immunodeficiency or serious systemic illness (e.g., HIV, uncontrolled diabetes, or malignancy). In such cases, further investigations, including immunological tests and complete blood work, become necessary. Rapid healing or localized bleeding without systemic symptoms usually indicates no major immunocompromise. Papillary recession in anterior areas alone might fit localized periodontitis or simple mechanical trauma.

90. (B) Systemic antibiotic course

If NUG shows systemic signs such as fever and lymphadenopathy, the infection likely extends beyond a localized gingival phenomenon. While initial debridement and antiseptic rinses are key, adding a systemic antibiotic (e.g., metronidazole alone or combined with amoxicillin) helps target anaerobic bacteria and spirochetes commonly implicated in necrotizing lesions. Antifungal therapy is not standard unless there is a documented mycotic infection. Gingivectomy or extracting necrotic papillae at this acute stage is inappropriate, as controlling the infection is paramount. Prompt antibiotic coverage, combined with continued hygiene measures, often facilitates rapid recovery and prevents deeper tissue involvement.

91. (B) Periodontal abscess

A periodontal abscess typically forms in deeper periodontal pockets, often following incomplete debridement or the entrapment of calculus and bacteria. Patients usually present with localized pain, swelling, and purulent exudate upon probing. Radiographs might confirm alveolar bone changes consistent with periodontitis. A gingival abscess, by contrast, arises more superficially in the marginal gingiva and does not necessarily involve existing periodontal pockets. Pericoronitis affects the gingiva around a partially erupted tooth, while an endodontic abscess stems from pulp infections and typically manifests near the apex of the root. Thus, a periodontal abscess best matches these features.

92. (B) A superficial collection of pus limited to the marginal gingiva or interdental papilla

A gingival abscess arises acutely in the marginal gingiva or interdental papilla, often following the impaction of foreign bodies (e.g., food debris) or trauma. It presents as a localized swelling with pus formation, confined to superficial soft tissues rather than underlying periodontal ligament or bone. Periodontal abscesses, on the other hand, occur deeper within existing pockets linked to periodontal disease. Necrotic processes involving alveolar bone are characteristic of osteomyelitis or advanced periodontal infections, not a straightforward gingival abscess. Thus, distinguishing the superficial focus of infection is key for appropriate acute intervention.

93. (B) Radiographic evidence of a deep periodontal pocket

A periodontal abscess often arises in the context of pre-existing periodontal pockets associated with periodontitis. Radiographs usually confirm moderate to advanced bone loss, reflecting underlying chronic inflammation. By contrast, a gingival abscess involves superficial tissues without substantial pocket formation or a history of significant periodontitis, often triggered by a local irritant such as a foreign object. A purely marginal swelling strongly suggests a gingival abscess, while the absence of any periodontal destruction on radiographs would also lean away from a periodontal abscess. Hence, the presence of deep pockets is a key distinguishing factor.

94. (C) Retained calculus harbors bacteria, causing acute flare-ups in periodontal pockets

Incomplete debridement leaves behind subgingival calculus laden with bacterial biofilms. These microorganisms can proliferate, trigger local inflammation, and lead to an acute periodontal abscess when the pocket environment becomes enclosed or drainage is obstructed. Rather than promoting healing, the retained irritant fosters further tissue destruction. Calculus does not support tooth structure or induce bone regeneration, and fibrotic healing would not spontaneously arise around calculus-laden pockets. Early, thorough scaling and root planing remain essential for preventing recurrent abscess formation and controlling disease progression in periodontal patients.

95. (B) Systemic antibiotics for every simple, small abscess

Management of gingival or periodontal abscesses routinely involves achieving adequate drainage and mechanical debridement of plaque and calculus. Controlling local factors (e.g., foreign bodies, occlusal trauma) also helps prevent recurrence. Systemic antibiotics are considered if systemic symptoms (fever, lymphadenopathy) are present, or if the patient is immunocompromised. However, they are not automatically prescribed for every minor, localized abscess that can be resolved via drainage and local measures alone. Unnecessary antibiotic usage may promote resistance and adverse side effects. Tailoring therapy to the clinical situation is the cornerstone of effective abscess management.

96. (B) A periodontal abscess is associated with a periodontal pocket, whereas an endodontic abscess originates from pulp infection

A periodontal abscess typically develops within an existing periodontal pocket where bacteria proliferate due to incomplete debridement or occluded drainage. By contrast, an endodontic abscess arises from necrotic pulp tissue following pulpitis or trauma and commonly presents near the tooth apex. Clinically and radiographically, endodontic lesions focus around the root apex, while periodontal abscesses correlate with lateral areas along the root in deeper pockets. Localization on buccal or lingual surfaces alone does not distinguish them. Correctly identifying the source of infection ensures proper treatment, whether via root canal therapy or periodontal intervention.

97. (B) Drain the abscess and thoroughly debride the pocket

The immediate priority for a periodontal abscess is achieving drainage of pus and removing plaque or calculus to eliminate the source of infection. This can be done via incision or gentle probing, followed by thorough scaling within the pocket. Mouth rinses alone are insufficient for acute abscess management, while extraction or extensive flap surgery may be considered if the tooth's prognosis is poor or conservative measures fail. Initially, controlling the infection through debridement and potential adjunct antibiotic therapy (if systemic signs emerge) remains the most appropriate approach for symptomatic relief and tissue preservation.

98. (B) Dislodging the foreign body and draining pus if present

Gingival abscesses often result from foreign objects wedged in the gingival sulcus or papilla, provoking acute inflammation and pus formation. The first and most effective step involves gently removing the irritant, thus eliminating the primary cause. Draining any accumulated pus further alleviates discomfort and fosters healing. Widespread surgical procedures or indefinite antibiotic regimens are unwarranted for a confined lesion triggered by a removable object. Delaying intervention may

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lead to enlarged infection or persistent discomfort. Thorough local debridement and patient education on preventing future trauma typically resolve the condition.

99. (C) Resolution of swelling and disappearance of sinus tract

The hallmark of successful management for a gingival abscess is the return of normal tissue contours and cessation of purulent drainage. Once the foreign material is removed or the abscess drained, swelling subsides, redness decreases, and any sinus tract closes. Pain intensity typically diminishes, indicating abatement of the acute infection. Ongoing pus discharge, persistent pain, or new tooth mobility would suggest incomplete treatment or a deeper lesion like a periodontal or endodontic abscess. Confirming clinically that the tissues are stable and healed ensures that the abscess is resolved.

100. (C) Immediate extraction of all teeth with deep pockets

Periodontal abscess management typically includes drainage, debridement, and local antiseptic measures. If systemic involvement—like fever or lymphadenopathy—presents, adjunct antibiotic therapy can be beneficial. Occlusal adjustments may help if traumatic occlusion exacerbates the abscess or worsens tooth mobility. However, extracting every tooth with a deep pocket at the outset is unwarranted. Many periodontally involved teeth can be salvaged with appropriate nonsurgical or surgical periodontal therapy. Extraction becomes a last resort if the tooth is deemed hopeless, not a routine step for abscess management in pockets that might otherwise respond to treatment.

101. (B) A device that binds loose teeth together to stabilize them and distribute occlusal forces

A periodontal splint is designed to stabilize mobile teeth by uniting them, thereby creating a more rigid unit that better withstands occlusal and functional forces. This approach prevents further tooth movement and relieves discomfort for patients experiencing mobility due to reduced periodontal support. Unlike an orthodontic wire, which moves teeth into alignment, a periodontal splint aims to preserve compromised but salvageable dentition. Sports mouthguards protect against trauma but do not stabilize periodontally involved teeth. Bite-raising appliances help alleviate temporomandibular joint stress but do not specifically address tooth mobility from periodontal disease.

102. (C) Pathological tooth mobility causing patient discomfort

Periodontal splinting is most commonly considered for teeth that exhibit pathological mobility beyond normal physiological limits and interfere with function or comfort. In advanced periodontal disease, alveolar bone loss undermines tooth stability, leaving them loose. Although signs like bleeding on probing, calculus, or pocket depths signal periodontal issues, they alone do not mandate splinting. Splinting specifically aims to reduce mobility, allowing the patient to chew and speak more comfortably and mitigating additional trauma to weakened periodontal structures. By improving stability, splinting also aids in maintaining better oral hygiene around these compromised teeth.

103. (C) It reduces functional trauma by distributing bite forces, allowing tissues to heal

When supporting structures are compromised by periodontal disease, individual teeth may become hypermobile and bear excessive forces during function. Splinting helps stabilize these teeth, distributing occlusal loads across multiple supports and lessening undue stress on any single weakened tooth. This stabilization facilitates a calmer environment for healing of inflamed tissues, potentially slowing or preventing further breakdown. Splinting does not restore alveolar bone or regenerate cementum directly; such regenerative outcomes depend on additional procedures, good oral hygiene, and overall periodontal therapy. Cosmetic lengthening of clinical crowns involves different procedures unrelated to occlusal force distribution.

104. (C) Minimal mobility confined to only one anterior tooth with no patient discomfort

Splinting is undertaken when mobility significantly compromises function or comfort, or when there is a risk of further injury to compromised teeth. Using a splint can help stabilize teeth before, during, or after regenerative treatments or orthodontic movement

in the context of reduced periodontal support. However, if only one tooth shows slight mobility (within physiologic limits) and the patient has no functional or aesthetic complaints, splinting offers little benefit. Such minimal mobility is generally monitored rather than managed invasively, especially if it does not impair chewing or speech, or lead to additional trauma.

105. (B) Extracoronal splints bond to the external enamel surface, whereas intracoronal splints involve a prepared channel inside the tooth

Periodontal splints can be positioned inside or outside the tooth structure. An intracoronal splint requires preparing a groove or channel within the tooth—commonly the proximal or lingual aspect—into which a rigid material is placed and then bonded. Extracoronal splints affix to the external surfaces, often using composite resin, wire, or fiber-reinforced materials. Neither type is strictly limited to anterior or posterior teeth, and both may be either temporary or long term. Typically, removable splints are designed as overlays or splint appliances, rather than relying solely on intra- versus extracoronal design.

106. (B) Provide a fiber-reinforced composite splint on the lingual surfaces

For patients experiencing problematic mobility in the lower anterior region, an immediate and conservative approach often involves an extracoronal splint using fiber-reinforced composite on the lingual surfaces. This offers stability while periodontal therapy (e.g., scaling, root planing, and potential regenerative procedures) proceeds. Extracting all mobile teeth is overly aggressive, especially if they are salvageable. Although chlorhexidine rinses aid in plaque control, they do not address the patient's comfort or the mechanical instability. A free gingival graft serves to augment keratinized tissue, not directly stabilize mobile teeth. Thus, a minimally invasive bonded splint is optimal initially.

107. (A) Fabrication of a removable acrylic splint or bite guard

When anterior tooth mobility hinders speech or daily functioning, fabricating a removable acrylic splint can provide interim stability. Such a device unites the teeth into a single functional unit, alleviating excessive stress during chewing or phonation. Permanent or semi-permanent splinting options can be considered once active inflammation subsides. Gingivectomy is not indicated for mobility issues; it addresses excess gingival tissue. While antibiotics may help control infection in acute scenarios, they do not mechanically stabilize teeth. Antiseptic mouthwashes also fail to address mobility directly, making a removable splint the most practical immediate intervention to improve function.

108. (B) Significant improvement in tooth mobility and stable periodontal attachment

Periodic reevaluation of a splinted segment helps determine if it has accomplished its goal. When inflammatory processes subside, alveolar bone levels and connective tissue support may improve, reducing pathological mobility. If probing depths remain stable and mobility returns to a functional range, removing or modifying the splint might be appropriate, especially if the splint complicates oral hygiene. Persistent bleeding, pain, or increasing recession typically signal ongoing periodontal issues that require further intervention. Thus, a clear indication for potential splint removal is a noted decrease in mobility supported by stable periodontal parameters.

109. (C) Leaving large overhangs of composite to reinforce the splint's strength

A well-placed bonded splint should have a smooth finish to facilitate plaque control and avoid gingival irritation. Large overhangs or bulky composite margins trap debris, complicate flossing, and potentially aggravate gingival tissues. Standard technique involves gently preparing the enamel surfaces (roughening, etching), applying a compatible bonding agent, and placing resin or fiber reinforcement. After curing, the dentist verifies occlusion to prevent premature contacts that could jeopardize the splint or traumatize the periodontium. Overbuilt composite does not necessarily increase strength but rather risks unintended plaque accumulation, leading to possible caries or gingival inflammation.

110. (C) Moderate to high, if inflammation is controlled and supportive tissues have time to repair

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In many cases, tooth mobility improves after effective periodontal therapy, especially if the patient maintains excellent oral hygiene and follows a regular maintenance schedule. By stabilizing teeth through splinting and minimizing additional traumatic forces, the tissues have an opportunity to heal and reorganize. While not all mobility vanishes completely, a notable reduction is frequently observed over time if the periodontal inflammation is well controlled. Immediate and complete resolution of mobility is unlikely, but a moderate to high probability of improvement exists once destructive processes are halted and healing processes take hold.

111. (C) By uniting multiple teeth, it disperses occlusal forces and lessens stress on each supporting structure

When periodontal support is diminished, individual teeth can become vulnerable to occlusal loads, leading to secondary occlusal trauma. Splinting pairs or groups these mobile teeth into one functional unit. Consequently, biting forces get redistributed across more periodontal ligaments and alveolar bone, lowering stress per tooth. Although splinting does not regenerate lost bone or cure periodontal disease by itself, it helps protect weakened areas from further mechanical damage. Proper oral hygiene remains essential, and teeth are not forcibly realigned through splinting alone. Instead, splinting reduces excessive localized forces that contribute to ongoing periodontal breakdown.

112. (A) Lingual bonded composite splint

Lingual bonded composite splints remain a favored choice for stabilizing anterior teeth exhibiting moderate mobility due to bone loss. By applying a thin layer of resin, possibly reinforced with a fiber strip, to connect the lingual surfaces of lower incisors, the dentist provides increased stability for biting. This minimally invasive approach maintains aesthetics, preserves tooth structure, and allows continued hygienic access at the gingival margins. Extraction is excessive for salvageable teeth, while routine antibiotics are not indicated unless there is acute infection. Crown lengthening addresses gingival architecture but does not address instability caused by reduced support.

113. (B) Temporomandibular joint disorder related to bruxism

Bruxism can lead to excessive occlusal forces, increasing tooth mobility and contributing to TMJ discomfort or other functional disturbances. A stabilization splint (often a hard acrylic night guard) can reduce the forces exerted on upper incisors, lessening mobility and alleviating stress on the TMJ. Caries, oral malignancies, or aphthous ulcers do not inherently require splints for stabilization. Instead, bruxism and the associated TMJ symptoms often call for an occlusal device that redistributes forces, prevents direct tooth grinding, and can protect vulnerable periodontally involved teeth from further mechanical trauma.

114. (B) Occlusal adjustment and regular scaling at recommended intervals

A well-implemented splint requires ongoing periodontal maintenance to prevent future breakdown. Regular scaling and root planing appointments—often every three to four months—help control plaque and calculus, ensuring the gingival tissues remain healthy. Occlusal checks are important as well, since the splinted teeth function as a single unit and may require fine-tuning to prevent undue stress. Radiographic checks can be done periodically but typically not every two weeks. Although softer diets can reduce chewing forces, it is generally not mandatory unless recommended for severe cases. Removing the splint prematurely risks recurrence of mobility and compromised function.

115. (B) Teeth with advanced attachment loss but salvageable support, requiring functional stability

Long-term splinting is typically indicated when significant periodontal destruction has rendered teeth mobile yet still capable of being preserved if forces are well controlled. Proper splinting, along with effective scaling, root planing, and possibly regenerative treatments, can allow these compromised teeth to remain functional. Light gingivitis without attachment loss does not generally call for splinting. Orthodontic treatment might employ temporary stabilization, but it is distinct from periodontal splinting. Edentulous patients have no natural teeth, so splinting is irrelevant. Hence, advanced attachment loss with remaining tooth viability is a prime scenario for extended splint usage.

116. (C) Progressive periodontal breakdown or vertical root fracture

When a previously stable splinted area resumes mobility or pain, clinicians must suspect further deterioration of the supporting periodontium or structural tooth damage. A vertical root fracture can mimic or exacerbate mobility, often going undetected until symptoms worsen. Progressive periodontal breakdown could reflect either reinfection or insufficient control of risk factors such as occlusal overload or poor oral hygiene. Caries at a crown margin or fungal tongue lesions are less likely to cause localized instability. Allergic reactions typically manifest with mucosal irritation, not specifically tooth mobility. Thorough clinical and radiographic evaluation helps diagnose and manage these potential issues.

117. (C) A "drifting" sensation or feeling that teeth are out of alignment when biting

Patients with periodontally compromised, mobile teeth may notice a shifting or drifting sensation as occlusal contacts change. This misalignment can make them feel uneasy or lead to difficulty biting or chewing. Over time, subtle changes in tooth position can intensify, creating aesthetic or functional concerns. Simple gingival recession doesn't necessarily cause drifting, and mild halitosis or occasional sensitivity in stable teeth might relate to other conditions. Ultimately, that sense of teeth moving or unpredictably contacting during function is a common complaint motivating patients to seek splinting as a means of regaining stability.

118. (C) A is true, R is false

Splinting helps stabilize mobile teeth, allowing them to function as a unit and reducing discomfort during chewing. It can indeed improve patient comfort. However, splinting in itself does not regenerate lost alveolar bone. Bone regeneration depends on specific periodontal regenerative procedures, grafting materials, and consistent plaque control. While splinting can facilitate a more favorable environment for healing by limiting occlusal trauma, it does not directly restore bone height. Therefore, the assertion that splinting improves comfort is accurate, but claiming splinting alone regenerates significant alveolar bone is incorrect, making (A) true and (R) false.

119. (B) Quarterly prophylaxis visits with regular adjustments or repairs of the splint

Long-term success of splinting relies on vigilant periodontal maintenance and close monitoring. Scheduling quarterly checkups allows the dental team to remove plaque and calculus thoroughly and to examine the splint for fractures, debonds, or rough margins that could trap plaque. Early detection and repair of minor splint issues keep the supporting tissues healthy and comfortable. Advising minimal chewing is unrealistic and does not address underlying risk factors. High-fluoride gels help combat caries but do not directly sustain splint integrity. A fixed splint cannot be removed weekly; professional intervention is necessary if modifications become required.

120. (C) Cone-beam computed tomography (CBCT) for detailed 3D imaging

Detecting a vertical root fracture can be challenging because standard periapical or bitewing radiographs may not capture the fracture line if it is oriented unfavorably. Cone-beam computed tomography provides a three-dimensional view, improving the chance of visualizing hairline fractures that disrupt tooth integrity. Thermal sensitivity tests help evaluate pulp vitality but do not diagnose root fractures. Although periapical X-rays can sometimes reveal a "J-shaped" lesion or other indirect signs, CBCT is more definitive if clinical suspicion remains high. Identifying such fractures early is crucial because they can compromise splint longevity and necessitate either endodontic or extraction intervention.

121. (B) Bonded lingual wire splint with hygiene instruction

A bonded lingual wire splint can provide immediate stabilization of the lower incisors, reducing movement that complicates the patient's brushing efforts. Combined with thorough hygiene instruction, the splint helps direct the patient to adapt interdental brushes or floss-threaders for maintaining cleanliness in the splinted region. Extracting the tooth may be considered if the tooth is beyond salvageable, but moderate periodontitis

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alone may not justify immediate extraction if the tooth is otherwise viable. Gingivectomy is unrelated to mobility and might actually reduce attached gingiva if done improperly. Prolonged antibiotic prophylaxis is unwarranted without systemic indications.

122. (A) Reinforcing patient-specific oral hygiene techniques

When plaque accumulates near the composite margins, the splinted region becomes prone to inflammation and potential breakdown if not addressed promptly. Merely leaving the splint or removing it prematurely does not ensure better periodontal health. Encouraging the patient to use interdental brushes, floss-threaders, or specialized aids in that area minimizes plaque retention and helps maintain stable periodontal pockets. A full liquid diet is neither practical nor likely to prevent plaque buildup. Antibiotics are generally reserved for acute infections or severe systemic manifestations. Consistent, thorough home care—together with regular professional debridement—remains the most effective long-term strategy for splinted segments.

123. (A) Occlusal adjustment and check for high points on the splint

After placing a fiber-reinforced composite splint, patients may develop minor bite interferences if the splint material is bulky or set too high in occlusion. The appropriate step involves carefully examining the contacts with articulating paper and modifying any premature contacts. Ensuring a stable, comfortable bite helps prevent additional traumatic forces that could undermine healing or cause discomfort. Removing the splint too soon negates its stabilizing benefit, and there is no indication for routine antibiotics unless infection is suspected. Localized gingivectomy addresses excess tissue, not occlusal imbalance. Thorough occlusal checks ensure the splint meets both functional and periodontal goals.

124. (B) Intracoronal splint involving the incisors and canines

The scenario describes stable bone levels following initial therapy, yet persistent functional difficulty from mobility in the maxillary anterior region. An intracoronal splint anchoring the incisors and canines can provide robust stabilization by distributing occlusal forces across multiple teeth with better support. Extraction of still-viable incisors is unwarranted if they remain restorable and respond well to periodontal therapy. Gingival curettage alone does not address mobility. Systemic antibiotics are not indicated in the absence of infection. Intracoronal splinting, performed in a carefully prepared internal channel, typically provides a more durable stabilization, improving biting comfort and long-term periodontal outcomes.

125. (A) Both A and R are true, and R explains A

Splinting can help stabilize mobile teeth by uniting them, but occlusal forces must still be optimized to prevent excessive load on compromised support. Selective occlusal adjustment is a process where minor interferences or high spots in excursive or protrusive movements are refined. By removing these prematurities, overall stress on the splinted segment is reduced. Consequently, tooth mobility may decrease, and patients often experience greater comfort in biting and chewing. Thus, both the assertion and the reason are correct, and the reason directly clarifies why occlusal adjustment complements splinting, making the combination a sound periodontal management approach.

126. (B) A surgery where gingival tissue is reflected to access roots and underlying bone

Periodontal flap surgery involves incisions in the gingiva to create a flap, which is carefully reflected to expose tooth roots, alveolar bone, or both for thorough debridement or regenerative procedures. This technique enhances visibility and accessibility, allowing for the removal of subgingival calculus, root planing, osseous recontouring, or graft placement. Implant placement may occur during separate or combined procedures but is not synonymous with a flap approach. Cosmetic lip operations and tooth extraction differ substantially from flap surgery, which primarily targets periodontal disease management and the preservation of at-risk teeth.

127. (A) Inverse bevel incision

Modified Widman flap surgery is a conservative surgical technique designed to remove pocket epithelium and provide direct access for root

debridement. Its hallmark is the inverse bevel (or internal bevel) incision, which is placed approximately 1–2 mm from the gingival margin, angled toward the alveolar crest. This incision strategy helps preserve gingival tissue while removing diseased pocket lining. Crestal incisions and frequent vertical releases are more commonly associated with other periodontal or implant surgeries. Laser technology can assist in soft tissue management, but the classical Widman approach typically uses scalpel incisions.

128. (B) To reduce deep infrabony defects and create favorable bone contours for stable soft tissue attachment

In advanced periodontitis, deep cratered bony defects can perpetuate plaque accumulation and hamper effective oral hygiene. By performing osseous recontouring (osteoplasty or ostectomy), the surgeon reshapes the alveolar bone to eliminate uneven architecture. This produces a more harmonious topography conducive to reattachment or stable gingival adaptation. Although bone regeneration procedures can sometimes rebuild lost bone, recontouring focuses on removing irregularities that predispose to pockets. Patient cooperation in oral hygiene is still essential, and recontouring does not address caries. Instead, it aims to restore healthier contours for improved maintenance and periodontal stability.

129. (C) Creation of deeper periodontal pockets for plaque retention

Periodontal surgery aims to manage diseased sites by facilitating thorough debridement, reducing pocket depths to a level that patients and professionals can effectively clean, and possibly regenerating lost structures where feasible. Achieving a stable, healthy gingival contour helps minimize plaque accumulation, prevent disease recurrence, and preserve tooth support. Thus, surgeons intentionally reduce or eliminate pockets instead of creating or deepening them. Deep pockets foster an environment conducive to ongoing bacterial colonization. Therefore, any surgical design that leads to deeper pockets would be counterproductive, making option (C) stand apart as not a valid surgical goal.

130. (B) A full-thickness flap involves reflecting gingiva and periosteum from the bone, whereas a split-thickness flap leaves periosteum intact

In periodontal surgery, flap design choice depends on specific treatment objectives. A full-thickness flap (mucoperiosteal flap) is elevated so that the periosteum is lifted off the bone surface, granting direct access to alveolar bone for osseous procedures. In contrast, a split-thickness flap preserves the periosteum on the bone, with only the superficial gingival layers reflected. This approach can be advantageous for certain mucogingival procedures where preserving blood supply to the bone is critical. Neither flap necessarily involves entire palatal or buccal tissue removal, nor does every split-thickness flap require grafting. Complete alveolar bone removal is not performed.

131. (B) Apically positioned flap with osseous recontouring

In posterior sites with deep pockets and angular (infrabony) defects, an apically positioned flap combined with osseous recontouring is a predictable surgical approach. Reflecting a flap enables direct root debridement and alveolar bone modification, helping reduce pocket depth and foster a more maintainable gum contour. Gingivectomy alone is less effective for infrabony lesions and does not address bone irregularities. Full-mouth extractions are an extreme measure reserved for hopeless situations. A frenectomy addresses the labial or lingual frenal attachment but does not reduce pockets. Consequently, a flap procedure with bone recontouring is the best solution.

132. (B) Full-thickness flap reflection on the buccal aspect

A 7 mm pocket on the buccal of a maxillary molar indicates subgingival deposits likely inaccessible via standard scaling alone. A full-thickness flap reflection permits direct visualization and thorough removal of calculus, plus the possibility of any needed osseous modifications. Simple curettage is typically inadequate for deep or complex pocket morphology. Tongue tie release (frenectomy) is irrelevant here. Extraction of a tooth that can be saved via surgical debridement is excessive. Once the flap is elevated, the clinician can plane the root surface, refine bone contours if necessary, and reposition the flap to optimize tissue health.

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133. (C) Suturing the flap margin at or near the alveolar crest to reduce pocket depth

In an apically positioned flap, the gingival tissues are repositioned toward the root apex, typically at or near the alveolar crest, following debridement or bone contouring. This placement reduces the final pocket depth by relocating the gingival margin more apically. Suturing without tension and careful adaptation of the flap edges are crucial for promoting stable healing. Placing the flap margin coronally or leaving abundant tissue tags would negate the purpose of pocket reduction. Healing by secondary intention is less predictable and rarely employed for flap edges in routine apically positioned flap procedures.

134. (C) Placement of sutures ensuring no close adaptation of the flap margins

Periodontal regenerative surgery involves meticulous root surface preparation, placement of graft materials or membranes (if indicated), and securing the soft tissue flap to create a protective environment for healing. Proper flap adaptation and stable suture placement are critical to prevent micro-movement, contamination, or bacterial ingress into the regenerative site. Deliberately leaving the flap margins unadapted or loosely approximated invites poor healing and can compromise regenerative outcomes. Hence, close and stable flap adaptation is vital. Debridement, grafting as indicated, and a supportive wound environment all aim to encourage new attachment and possible bone formation.

135. (B) Very low without additional supportive therapies and excellent patient compliance

While periodontal regenerative techniques using grafts or membranes can promote bone fill and new attachment, complete restitution of the original bone height is not guaranteed. Many factors, including defect morphology, patient oral hygiene, and host response, influence the outcome. Appropriate supportive care—frequent maintenance visits, rigorous plaque control, and careful case selection—significantly enhances the potential for regeneration. Deep defects may offer more regenerative potential, yet there is still no absolute guarantee of total restoration to pre-disease levels. Patient commitment to meticulous home care is vital, as persistent bacterial challenge can negate the benefits of surgical intervention.

136. (B) Bacterial recolonization interrupts healing and perpetuates inflammation

Periodontal surgery aims to reduce pockets and establish an environment that facilitates tissue repair or regeneration. However, if the patient fails to maintain excellent plaque control, bacteria quickly recolonize the operated sites, stirring up inflammation. This disrupts the delicate healing cascade, impedes clot stabilization, and undermines fibroblast and osteoblast activity, all of which are vital for tissue repair. As a result, residual pocket depths or recurrent pocket formation can occur. Adequate oral hygiene, reinforced by professional maintenance, is thus crucial for ensuring a stable result and preventing perpetuation of periodontal breakdown post-surgery.

137. (B) Osseous surgery (flap with recontouring or regeneration)

Persistent 8 mm pockets, particularly in infrabony defects, typically require surgical intervention to allow direct access for debridement and the possibility of osseous modification or grafting. Osseous surgery involves reflecting a flap, removing diseased tissues, and possibly placing regenerative materials in bony defects to encourage new attachment. A standard gingivectomy is insufficient for infrabony lesions and does not improve access to deep pockets. Immediate implant placement might be considered if teeth are non-restorable, but it does not address saving existing dentition. Palatal grafts mainly address mucogingival concerns rather than substantial pockets from periodontitis in the mandible.

138. (A) Operculectomy combined with distal wedge procedure

When a partially erupted last molar (often a third or second molar) is associated with persistent pocketing and recurrent pericoronitis, a distal wedge procedure offers a way to remove excess tissue distal to the tooth. This technique reduces pocket depth and eliminates the operculum. An operculectomy may be done simultaneously to ensure all inflamed or redundant tissue is cleared. Coronally advanced flaps or lateral pedicle grafts address recession or

coverage needs in anterior sites, not the removal of distal tissue around posterior teeth. Flapless implant placement is unrelated unless the molar is being extracted.

139. (B) Provide mucogingival grafting if the patient is stable and suitable for root coverage

When an apically positioned flap is used to reduce pockets, more root structure may become exposed, potentially raising esthetic or sensitivity concerns. If the patient's periodontal disease is under control and the tissue conditions are amenable, subsequent mucogingival procedures (e.g., connective tissue graft or coronally advanced flap) can restore coverage, improve esthetics, and reduce sensitivity. Immediate crown lengthening is not indicated here because that typically further exposes tooth structure. Advising the patient simply to ignore the issue is unhelpful. Long-term antibiotic use is unwarranted unless a specific systemic condition necessitates it, which is rare.

140. (B) Return in 7–10 days for suture removal and professional evaluation

Postoperative guidance for flap surgery typically includes a gentle approach to oral hygiene—avoiding forceful brushing over the surgical site initially—while prescribing chlorhexidine rinses or mild saline solutions. The patient is generally instructed to return after about 7–10 days for suture removal, ensuring that healing progresses correctly and allowing the clinician to assess the surgical site. Vigorously rinsing might disrupt the healing clot, while completely halting brushing may lead to excessive plaque accumulation. Sugary drinks are counterproductive to periodontal and overall oral health, making them unsuitable as a healing recommendation.

141. (B) Inadequate plaque control leading to infection or bone sequestration

While mild discomfort can persist for a short period post-surgery, ongoing pain and the presence of pus two weeks later suggest a complication such as infection or partial necrosis of the alveolar bone (bone sequestration). If the patient's plaque control is inadequate, bacteria can proliferate at the surgical site, compromising healing and potentially leading to a localized infection. Normal postoperative discomfort tends to subside significantly by two weeks, and alveolar bone regeneration does not present with suppuration. Ensuring no other underlying issue, like a missed root fragment or poor suture adaptation, is crucial for proper resolution.

142. (B) No signs of acute inflammation, minimal swelling, and stable tissue margins

Within approximately one week post-flap surgery, signs of proper healing include reduced swelling, absence of significant redness or bleeding, and firm approximation of gingival margins to the tooth. The tissues begin to mature without major exudate or necrosis. Profuse bleeding, pus, or severe radiating pain typically indicates infection, unresolved inflammation, or other complications. Although some transient discomfort can be normal, severe persistent pain warrants further investigation. Observing stable margins with minimal swelling or bleeding is a positive sign of uncomplicated postoperative recovery and suggests that the surgical site is progressing toward healthy reattachment.

143. (C) A is true, R is false

Periodontal flap surgeries (like apically positioned flaps) indeed help reduce pocket depths, often by recontouring or repositioning tissues. However, true gain in clinical attachment typically involves new cementum, periodontal ligament, and alveolar bone formation, which does not commonly occur from flap closure alone. Regenerative materials—bone grafts, membranes, or biologic agents—may foster new attachment in certain defect morphologies. Merely apposing the flap margin apically might yield shallower probing depths, but that does not always translate to new attachment at a histologic level. Hence, the assertion is correct, but the reason is incorrect regarding how attachment gain actually occurs.

144. (B) Have the patient compress the area gently with sterile gauze and contact the office if bleeding persists

Postoperative bleeding can occur, especially within the first few days after flap surgery. Advising the patient to gently apply pressure with sterile gauze is a prudent step to control minor bleeding. If bleeding continues or worsens, the patient should promptly return for an examination to rule out suture issues,

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clot instability, or other complications. Completely removing the dressing prematurely might exacerbate bleeding or disrupt the clot. Scheduling immediate re-suturing under general anesthesia is excessive unless there is a severe complication. Antibiotic therapy is indicated only if signs of infection arise, not for routine bleeding control.

145. (B) Slight increase in radiopacity at the defect site over several months

Successful regeneration in vertical bony defects typically manifests as a gradual radiographic increase in density or opacity within the defect, indicating new bone formation. This process is slow; expecting dramatic fill in just a week is unrealistic. Radiographic imaging may lag behind clinical healing by months. If the defect appears unchanged or shows an expanding radiolucency, it could suggest compromised healing or infection. Complete and immediate fill is unfeasible within the short term, as bone remodeling is protracted. Thus, a progressive, modest increase in radiopacity over time generally signifies healthy regenerative progress.

146. (B) Confirm normal healing and advise continued gentle oral hygiene

One week post-surgery, mild swelling without suppuration or severe pain is often within normal limits, especially in a smoker, who may experience slower healing. If sutures remain intact and pockets of infection are absent, it usually signifies stable recovery. Reopening the flap or administering IV antibiotics is unnecessary unless signs of severe infection or systemic involvement emerge. Removing the sutures prematurely can disrupt the wound. Reinforcing gentle but consistent plaque control—often with a soft brush and mild rinses—facilitates optimal healing. Hence, the best step is to confirm that healing is proceeding normally and provide supportive oral hygiene instructions.

147. (B) Desensitizing agents or varnishes on exposed root surfaces

Post-surgical root exposure or reduced pocket depths can occasionally reveal dentinal tubules, triggering cold sensitivity. When clinical examination confirms healthy soft tissue adaptation and stable periodontal conditions, re-entry or extraction is unwarranted. Instead, applying desensitizing agents or varnishes can block exposed tubules, easing thermal sensitivity as healing continues. Some patients benefit from potassium nitrate or stannous fluoride products at home. Replacing sutures is unnecessary unless healing is compromised, which does not appear to be the case. As tissues mature over the following weeks, sensitivity often lessens, especially if oral hygiene remains adequate and desensitizing treatments are used.

148. (A) Membrane removal if indicated by the specific material's protocol

Guided tissue regeneration (GTR) often uses barrier membranes to exclude the epithelium and allow the slower-growing periodontal ligament and bone cells to colonize the defect. Some membranes are bioabsorbable and do not need removal, whereas others are non-resorbable and must be surgically retrieved after a designated interval to prevent infection or membrane exposure. If radiographs show stable bone fill and the patient only has minimal discomfort, repeating a second surgery or placing full crowns is premature. Halting oral hygiene is counterproductive. Thus, following the membrane's specific protocol—potentially removing it if non-resorbable—is the logical next step.

149. (C) Ongoing periodontal maintenance and meticulous home care

Even after successful periodontal surgery that yields marked pocket reduction and improved stability, ongoing maintenance care remains vital. Periodontal pathogens can repopulate if oral hygiene lapses or professional cleanings are sporadic. Regular maintenance visits—often every three to four months—enable thorough debridement, monitoring of pocket depths, and early detection of relapse. Additionally, consistent home care, including proper brushing and interdental cleaning, helps sustain the surgical benefits by minimizing plaque buildup. Tooth extractions are reserved for hopeless cases, and fixed bridges are not mandatory unless restorative needs arise. Annual prophylaxis alone typically falls short of ensuring durable periodontal health.

150. (C) A is true, R is false

Certain types of infrabony or angular defects respond favorably to regenerative periodontal surgery, fostering new bone, cementum, and periodontal ligament. However, bone loss with a predominantly horizontal pattern rarely regains original height spontaneously. It typically requires advanced procedures (if feasible) and meticulous maintenance to achieve meaningful improvement. Thus, the assertion that some defects can be regenerated is correct, but the reason claiming that horizontal bone loss always regrows spontaneously is incorrect. Horizontal defects often demonstrate limited regenerative potential, making them more suited to resective or recontouring approaches for pocket reduction rather than complete restoration of lost bone.

151. (B) Surgically exposing more tooth structure above the gingival margin

Crown lengthening aims to expose sufficient tooth structure for restorative or cosmetic purposes by repositioning the gingival margin and, if necessary, reducing alveolar bone. This procedure helps ensure the restoration margins do not encroach on the biologic width, reducing the risk of chronic inflammation. It is not performed to address infrabony pockets (that would be osseous resective surgery) and does not involve placing grafts for root coverage. Extracting mobile teeth removes them rather than lengthening their clinical crowns. Therefore, the main objective is to modify gingival and bony contours to gain tooth length.

152. (A) Raising a flap and removing a minimal amount of bone to expose sound tooth structure

Functional crown lengthening is performed to expose enough tooth structure for proper retention of a new crown or restoration. After reflecting a flap, the surgeon may recontour alveolar bone to extend the supragingival portion of the tooth, respecting the biologic width. This ensures the restoration margin stays clear of periodontal attachment structures. A free gingival graft helps with root coverage or soft tissue augmentation, not crown lengthening. Maintaining a tooth in supra-occlusion can exacerbate occlusal trauma. Merely placing antibiotic gel in the papilla does not address the need for additional tooth structure for retention.

153. (B) It ensures adequate room for epithelial and connective tissue attachment, preventing chronic inflammation

The biologic width consists of the junctional epithelium and supracrestal connective tissue that attach the gingiva to the tooth. When a restoration encroaches upon this zone, it can trigger persistent inflammation, pocket formation, or even bone loss. Preserving a minimal distance—generally 2–3 mm—from the alveolar crest to the restoration margin lets the gingiva remain healthy. Directly bonding onto alveolar bone is neither possible nor desirable, and a flap might still be reflected for improved access. Maintaining biologic width supports a stable environment, but it does not universally eliminate the need for crowns.

154. (C) Exposing root surfaces with no plan for a restorative margin

Crown lengthening can be carried out to remove excess gingival tissue for cosmetic improvement (e.g., a "gummy smile") or to expose more tooth structure for placing restorations. When caries, fractures, or restorative margins are dangerously close to the gingival margin, lengthening ensures enough tooth is supra-gingival to preserve tissue health. Merely exposing root surfaces without an intention to either restore or address an aesthetic concern is pointless. Such exposure can lead to sensitivity, root caries, or esthetic compromises. Thus, no plan for restoration is not a valid indication.

155. (C) Esthetic procedures aim primarily to correct a "gummy smile," whereas functional procedures create adequate tooth structure for restorations

Esthetic crown lengthening is performed to enhance the smile line by reducing excessive gingival display, often in the anterior region. On the other hand, functional crown lengthening addresses subgingival caries, fractures, or insufficient tooth structure for restorations, typically necessitating alveolar bone contouring. Both procedures may involve raising a flap and resecting bone, but the primary objective differs: aesthetic improvement vs. providing adequate tooth length for predictable crown margins. Although posterior teeth can also require functional lengthening, the distinction lies in the goals of the surgery, not exclusively in location or the volume of bone removed.

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156. (A) Esthetic crown lengthening with a gingivectomy if needed

When excessive gingival display exists but the periodontium is otherwise healthy, an esthetic crown lengthening procedure can remove or reposition some gingival tissue (and occasionally a small amount of bone) to create a more balanced tooth-to-gum ratio. A gingivectomy might suffice in superficial cases if the bone crest is not too close to the desired new margin. Immediate implants, extractions, or horizontal ridge augmentation are unwarranted absent deeper structural issues or tooth loss. By carefully reshaping gingiva and possibly alveolar bone, the surgical team can achieve a harmonious gum line without resorting to more invasive measures.

157. (B) Functional crown lengthening with apical flap positioning and osteoplasty

When decay or a fracture line extends deep subgingivally, obtaining a clean restorative margin that respects the biologic width is essential. Functional crown lengthening raises a flap, adjusts the bone (osteoplasty or ostectomy) if necessary, and repositions gingival tissues apically, thereby creating the 2–3 mm of tooth structure needed. Pure gingivoplasty might remove soft tissue but fail to reestablish adequate distance from the alveolar crest. Orthodontic extrusion is an alternative but not always practical or timely. A frenectomy does not address subgingival lesions; it merely repositions muscular or frenum attachments in the vestibule.

158. (C) Biologic width—the distance from alveolar crest to gingival margin for adequate attachment

Before crown lengthening, the clinician must determine if enough space exists between the alveolar crest and the intended restorative margin, commonly referred to as biologic width. Typically, about 2–3 mm of clearance is needed to avoid chronic irritation and ensure healthy gingival reattachment after surgery or restoration. Evaluating attached gingiva, sulcular fluid, or fremitus alone will not confirm that the tooth has adequate vertical space for margin placement. Maintaining a proper biologic width prevents inflammatory responses and fosters stable periodontal conditions. Thus, measuring this dimension is fundamental in planning a successful crown lengthening procedure.

159. (C) Leaving the gingival margin at the same level as preoperative measurements

Esthetic crown lengthening aims to reposition the gingival margin apically to reduce excessive display and create symmetry. Hence, leaving it unchanged would defeat the purpose of the procedure. Evaluating the patient's smile line, ensuring symmetrical gingival architecture, and adjusting bone height to preserve the biologic width are essential. Carefully planned incisions and flap positioning yield a harmonious gingival contour, blending with adjacent teeth. If the margin remains at its initial level, the excessive gingival display persists, failing to address the patient's esthetic concern, thus making that step incorrect in esthetic crown lengthening.

160. (A) Very high—well-performed surgery with consistent plaque control often results in stable margins

A well-executed crown lengthening procedure, paired with diligent post-operative care and thorough oral hygiene, generally yields stable tissue levels around the tooth. Minimal regrowth can occur during the early healing phase, but once tissues mature and the biologic width is respected, significant relapse is uncommon. There's no necessity for lifelong antibiotics unless an underlying systemic issue exists. While minor variability in tissue rebound can happen, outcomes are largely predictable when biologic principles and meticulous technique guide treatment. Good patient compliance helps maintain favorable results and ensures that the final margin remains stable long-term.

161. (B) Plaque accumulation leads to persistent inflammation, impeding healing and stable margin placement

Maintaining a clean surgical site post-crown lengthening is crucial for successful tissue healing. If patients neglect oral hygiene, plaque and bacteria build up around the newly positioned margins, provoking inflammation and possibly prompting the tissue to rebound coronally or form pseudopockets. This chronic irritation undermines the surgical objective of establishing a stable gingival margin

for the definitive restoration. It does not cause alveolar bone to overgrow or the restoration to seat deeper. Additionally, poor hygiene is not directly linked to nerve necrosis. Thus, controlling plaque is a key factor in preserving surgical outcomes.

162. (B) Functional crown lengthening

When caries or fractures repeatedly occur at or below the gingival margin, it suggests an inadequate band of tooth structure above the alveolar crest. Violating the biologic width can lead to persistent gingival inflammation, recurrent decay, or fractured restorations. Functional crown lengthening recontours the gingiva and, if needed, alveolar bone to create a safe distance between the margin and bone. Simple gingivoplasty alone does not address deeper bone issues, while incisional biopsy is irrelevant unless a suspicious lesion exists. Immediate implant placement is considered if the tooth is non-restorable, but crown lengthening is first-line here.

163. (C) Biologic width impingement causing chronic inflammation

When a restoration margin extends too far subgingivally—less than 2–3 mm from the alveolar crest—it can encroach upon the supracrestal tissue attachment ("biologic width"). This intrusion irritates the gingival tissues, leading to persistent inflammation and potential bone loss. The presentation often includes consistent redness, bleeding, and localized pocket formation. Gingival fibromatosis is a fibrotic overgrowth unrelated to subgingival restorations, and a mucocele is a salivary gland lesion commonly found on the lip or oral mucosa. A traumatic ulcer typically appears as a localized wound, not chronic gingival swelling around a restoration. Hence, biologic width violation is the culprit.

164. (B) Crown lengthening surgery, healing, then tooth preparation and crown placement

When insufficient supra-gingival tooth structure remains, placing a final crown margin near or below the alveolar crest often triggers chronic inflammation or an unpredictable gingival response. Performing crown lengthening to re-establish a healthy biologic width allows adequate healing before definitive tooth preparation. After proper healing, the dentist can finalize the crown prep, ensuring the new margin does not encroach upon soft tissues. Extracting the tooth is excessive if salvageable structure remains, and treating non-involved neighboring teeth endodontically is unnecessary. Skipping surgery may lead to recurrent caries, inflamed tissues, or a failing restoration.

165. (C) Six to eight weeks or longer, allowing stable gingival healing

Most clinicians recommend a healing period of about six to eight weeks after crown lengthening to permit tissue stabilization, though extended times may be required for complex cases. This allows the gingival margin and underlying bone to adapt, preventing further alterations that could compromise the final restoration fit or gingival health. Immediate or very short waiting times can cause margin misplacement if the gingiva rebounds or if residual inflammation persists. While some simpler gingivectomies might heal faster, a typical crown lengthening with bone recontouring benefits from roughly six to eight weeks before final impression or definitive restoration placement.

166. (B) Overactive or hypermobile upper lip

Not all "gummy smiles" result from excessive gingival tissue or short clinical crowns. In some cases, the lip length and its mobility are key. A hypermobile upper lip can lift excessively during smiling, exposing a larger band of gingiva. Esthetic crown lengthening alone may not address this if normal tooth proportion and gingival architecture are already present. Intrinsic discoloration or exostoses do not cause excessive gingival display. A fibrous epulis is a focal growth, not a general overexposure of gingiva. Thus, diagnosing lip-related issues before committing to gingival surgery is critical for correct esthetic management.

167. (B) Continuation of inflamed gingiva around the restoration margin

If bone is not sufficiently recontoured to recreate a proper biologic width, the soft tissue may remain inflamed because the new restoration margin still impinges on the tissue attachment. As a result, persistent redness, swelling, or bleeding can continue, signaling suboptimal healing and ongoing biologic width violation. Rapid pocket formation

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can also occur, but stable margins with deep pockets is less common if the margin is precisely placed. Total inflammation resolution within one week is unlikely, as healing typically takes longer. Tooth mobility is multifactorial and not an immediate indicator of insufficient bone recontouring.

168. (A) Both A and R are true, and R explains A

Esthetic crown lengthening for a "gummy smile" can sometimes be resolved by merely removing redundant soft tissue, assuming alveolar bone levels are at an acceptable distance from the CEJ. This scenario often corresponds to altered passive eruption, where the gingiva fails to recede to its normal level after tooth eruption. In such cases, alveolar bone recontouring may not be necessary if the biologic width is preserved. Both the assertion and reason are correct, with the reason clarifying why minimal or no bone removal might suffice in certain presentations of excessive gingival display.

169. (A) Apply desensitizing agents or fluoride varnish to exposed root surfaces

Following crown lengthening, newly exposed root surfaces often present open dentinal tubules that can generate thermal or tactile sensitivity. Initial management focuses on conservative measures: applying professionally dispensed desensitizing products like fluoride varnishes or other tubule-occluding agents to reduce sensitivity. Root canal therapy is excessive unless there is clear evidence of irreversible pulpitis or necrosis. Further osseous recontouring would not solve sensitivity and could compromise tooth support. Extraction is equally drastic for otherwise healthy teeth. Reinforcing gentle oral hygiene and possibly recommending at-home desensitizing toothpaste can also help reduce discomfort during the healing phase.

170. (A) A 1–2 mm distance from alveolar crest to restoration margin

To maintain healthy gingiva and avoid recurrent inflammation, the radiographic distance between the alveolar crest and the restoration margin should usually be at least 2 mm, although some guidelines may specify 2–3 mm. This gap respects the biologic width and provides room for proper soft tissue attachment. Large periapical radiolucencies suggest endodontic or periapical pathology, while radiopaque lines near the pulp or a thick alveolar crest are irrelevant to verifying crown lengthening success. Ideally, the clinician correlates radiographic findings with clinical measurements to ensure the alveolar crest is sufficiently recontoured for stable gingival margins.

171. (B) Preserving 2–3 mm of biologic width

When minimal coronal structure remains, ensuring a stable, healthy margin for the final crown is paramount. Preserving 2–3 mm of biologic width between the alveolar crest and the restoration margin is a well-established requirement to prevent persistent inflammation, bone resorption, or pocket formation. Placing the margin only 0.5 mm below the gingiva or skipping the necessary bone recontour often violates this width. Cementing a restoration immediately can risk margin mismatch if tissues haven't healed. Using glass ionomer for the core is unrelated to biologic width considerations. Respecting the biologic width is thus crucial.

172. (A) Simple gingivectomy/esthetic crown lengthening

For a patient with excessive gingival coverage yet normal underlying bone levels, the likely diagnosis is altered passive eruption or gingival overgrowth. A straightforward gingivectomy or an esthetic crown lengthening approach can remove surplus gingival tissue, reestablishing a proper crown-to-gum ratio. Radiographs showing no infrabony defects confirm that significant osseous recontouring is unnecessary. Frenectomy targets high frenum attachments, which is not the issue here. Meanwhile, free gingival grafts are used to augment attached gingiva or cover recession, not to reduce gingival display. Therefore, a simple gingivectomy or minimal flap procedure suffices to reshape the gummy smile.

173. (A) Apically positioned flap with osseous recontour for functional crown lengthening

When restoration margins lie close to the alveolar crest, biologic width is compromised. Combining an apically positioned flap with osseous recontouring addresses the insufficient coronal tooth structure by moving the gingival margin apically and reshaping bone as needed. This procedure ensures adequate clearance between restoration margin and alveolar crest, reducing inflammatory risks. Palatal rolling

flaps or connective tissue grafts are for root coverage or soft tissue augmentation, not for exposure of subgingival decay. Vertical root resection removes a root portion in multirooted teeth but fails to create additional supragingival tooth structure for stable crown margins.

174. (B) Combine apically positioned flap with partial-thickness design and possible mucogingival augmentation

When minimal keratinized gingiva is present and functional crown lengthening is indicated, the surgeon must preserve or augment the attached gingiva to avoid shifting the mucogingival junction excessively and exposing alveolar mucosa. Employing a partial-thickness apically positioned flap can help maintain periosteal blood supply and reduce the risk of significant recession. Additionally, mucogingival techniques or a soft-tissue graft can be integrated if needed for increased coverage. A straightforward gingivectomy might inadvertently eliminate vital attached tissue. Extracting the molars is unjustified if they remain restorable, and unnecessary delays risk further caries progression and periodontal compromise.

175. (C) Orthodontic extrusion can preserve gingival architecture without extensive bone removal

Orthodontic extrusion, also termed forced eruption, can be an alternative to crown lengthening when only one or a few teeth need additional coronal structure. By slowly moving the tooth occlusally, bone and gingiva can follow, preserving or even increasing attached tissue. This approach avoids the alveolar bone resection necessary in surgical crown lengthening, which can compromise adjacent teeth or gum contours. Surgical crown lengthening does not inherently cause pulp necrosis, nor is it incapable of achieving biologic width. Each method has advantages depending on the specific clinical circumstances and patient preferences.

176. (A) Transferring a segment of gingiva from the palate or other donor site to increase keratinized tissue

A free gingival graft involves harvesting a thin layer of tissue—usually from the palatal mucosa—then suturing it onto a recipient site lacking sufficient keratinized gingiva. Once it establishes a blood supply, the graft helps widen the band of attached gingiva, improving plaque control and tissue stability around teeth or implants. Alveolar bone removal to reduce pockets is a separate resective procedure, while resin splinting stabilizes mobile teeth without adding gingiva. Bone grafts aim to promote osseous regeneration in intrabony defects, not keratinized tissue augmentation. Hence, a free gingival graft specifically addresses soft tissue deficiencies.

177. (B) Mucogingival junction near the tooth margin with persistent recession

A free gingival graft is commonly utilized when there is insufficient keratinized gingiva to maintain periodontal health, often manifested by recession reaching or surpassing the mucogingival junction. Thickening or broadening the band of attached gingiva helps stabilize the gingival margin and improves patient comfort during brushing. In deep vertical bone loss, regenerative or resective osseous procedures are more relevant. If there is already an abundance of attached gingiva, grafting is unnecessary. Fully edentulous ridges lacking implant plans do not typically require gingival grafts unless specific mucosal concerns (e.g., prosthesis support) arise.

178. (C) Facilitates plaque control, reduces inflammation, and provides stable soft tissue margins

A sufficient band of keratinized tissue around teeth or implants aids in resisting mechanical trauma from brushing and masticatory forces. Keratinized gingiva is more resilient to inflammation than looser alveolar mucosa, thus supporting better plaque control and more predictable long-term periodontal health. While it may enhance esthetics as well, the main benefit is maintenance of a stable margin that resists recession. It does not inherently prevent caries or negate the need for daily cleaning. Adequate keratinized tissue fosters a functional, comfortable environment, reducing risk of persistent inflammation or soft tissue breakdown.

179. (D) Leaving the graft unattached for secondary intention healing

Successful free gingival grafts rely on precise adaptation and secure suturing over a prepared recipient site so the graft can develop a stable

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blood supply. Harvested palatal tissue is typically shaped to fit, then sutured or fixated to minimize micromotion. Healing by secondary intention would occur if the graft is not placed or stabilized properly, jeopardizing graft survival. Instead, a well-seated, immobile graft fosters successful revascularization. Letting the graft remain unattached invites contamination, necrosis, or displacement, making that step incorrect among the essential phases of free gingival graft procedures.

180. (C) A free gingival graft includes epithelium and connective tissue, while a subepithelial graft primarily transfers connective tissue beneath a partial flap

A free gingival graft typically comprises an epithelial layer plus connective tissue, harvested from the palate, to increase the width of attached gingiva. Conversely, a subepithelial connective tissue graft is predominantly composed of the lamina propria, with the epithelium left behind at the donor site. The latter is particularly popular for recession coverage or contour improvements, placed under a recipient flap to achieve a better cosmetic blend. Each graft type addresses different needs (keratinized tissue augmentation vs. root coverage) and is harvested from the palatal area. Alveolar mucosa is not a standard donor site.

181. (A) Subepithelial connective tissue graft

Subepithelial connective tissue grafting is renowned for its excellent predictability in root coverage procedures and for improving gingival thickness. Harvested from the palatal area beneath the epithelial layer, this graft is placed under a coronally advanced flap at the recipient site, blending well aesthetically. Gingivectomy would remove tissue rather than restore coverage. A frenectomy deals with frenum attachments, which is not the key factor in recession unless tension from a frenum is pulling the gingiva. A free rotated palatal flap is less commonly used, especially when more targeted techniques for root coverage exist.

182. (B) Coronally advanced flap with subepithelial connective tissue graft

When an adequate papilla is present, a coronally advanced flap combined with a subepithelial connective tissue graft is a tried-and-tested method for covering exposed roots. The connective tissue graft increases gingival thickness and improves root coverage predictability, while the coronally advanced flap repositions existing gingiva over the denuded surface. A distal wedge procedure targets distal pockets behind molars, not facial recession. Gingivoplasty reshapes gingival contours but does not provide coverage. A lateral sliding flap requires sufficient donor tissue from an adjacent tooth area, whereas the subepithelial graft approach is more versatile for multiple recession sites.

183. (C) Pink, firm gingiva bridging the previous recession site with minimal inflammation

In a successful subepithelial connective tissue graft, the transplanted tissue integrates with the recipient site, resulting in a healthy gingival color, firm consistency, and coverage of the previously exposed root. Minimal bleeding or inflammation indicates stable healing and minimal bacterial challenge. Ongoing root sensitivity often reflects incomplete coverage or healing. Graft necrosis or notable sloughing suggests poor adaptation or compromised blood supply. Significant bone loss at the donor site is also undesirable. Hence, a pink, non-inflamed band of tissue effectively bridging the recession area demonstrates the hallmark of graft success.

184. (B) Leaving the graft unsupported, allowing it to move with the patient's tongue

In subepithelial connective tissue grafting, clinicians harvest a connective tissue segment from the palatal donor site. They then stabilize this graft beneath a partial-thickness recipient flap, ensuring proper adaptation and minimal movement. Achieving a passive coronal reposition of the overlying flap helps maximize coverage and enhance vascular integration. Leaving the graft free to shift or slip due to tongue movements or lip tension would jeopardize healing, resulting in potential necrosis or incomplete coverage. Therefore, firm stabilization via sutures and a flap that ensures immobility is crucial for successful graft integration and root coverage.

185. (B) Quite high, often achieving 80-100% coverage

Subepithelial connective tissue graft procedures boast a strong track record for addressing gingival

recession. Studies often report substantial root coverage—80% to complete coverage—particularly in Class I and II recession defects, provided that tissue thickness, flap design, and postoperative care are well controlled. While results can vary per individual anatomy and site specifics, the success rate is generally favorable. No single outcome is universally guaranteed, but it is far from random or minimal if conditions are ideal. Consequently, patient compliance with hygiene and proper technique are pivotal for maximum predictable coverage and long-term success.

186. (C) Disruption of the blood supply and micro-movement inhibit successful graft healing

Soft tissue grafts rely on quick revascularization from the recipient bed. If the flap is under undue tension or not sutured securely, micro-movement and compromised circulation can jeopardize graft survival. Lack of stable contact and blood flow leads to necrosis rather than adaptation and healing. Tension does not accelerate osteogenesis or keratinization in a grafted site. Instead, stable positioning with minimal movement is essential for alveolar vessels to connect with the graft. Hence, surgeons strive for "passive" flap closure, ensuring enough mobility in the tissue to overlay the graft without pulling or shearing forces.

187. (C) Subepithelial connective tissue graft

When recession coexists with a thin gingival phenotype, subepithelial connective tissue grafting is a superior approach to both build tissue thickness and achieve root coverage. By placing a connective tissue segment under a coronally advanced flap, clinicians can create a more robust gingival margin. Free gingival grafts typically address increasing keratinized tissue width but are less aesthetic and can appear color-mismatched. Allograft granules are more commonly used for bone augmentation, not thin gingival coverage. A "sutureless flap" is not a recognized standard technique, as sutures ensure stability. Thus, a connective tissue graft is ideal.

188. (B) Minimal attached gingiva with a high mucogingival junction near the recession

When the mucogingival junction is close to the gingival margin, the zone of attached gingiva is inadequate. Patients may experience discomfort during brushing, difficulty in plaque control, and progressive recession risk. A free gingival graft can be placed to build a sufficient band of keratinized tissue, stabilizing the environment before further recession coverage procedures. If the band of keratinized tissue is already adequate (≥3 mm), grafting specifically to widen attached gingiva is less necessary. Thick gingival phenotypes with excessive display require different approaches, such as esthetic crown lengthening. Thus, minimal attached gingiva is the key indication here.

189. (B) Subepithelial connective tissue graft, as it often blends more seamlessly with adjacent tissue

Subepithelial connective tissue grafts, covered by a partial-thickness or coronally advanced flap, typically offer superior color and contour matching, making them well-suited for recession sites that are visible when smiling. They provide both coverage and increased thickness while blending well with surrounding gingiva. A free gingival graft can appear lighter or more textured than adjacent tissue, particularly in the esthetic zone, which some patients may find unacceptable. Using an alloplastic membrane or bone augmentation does not directly address superficial recession. Therefore, a subepithelial connective tissue graft is generally recommended for aesthetically critical recession defects.

190. (B) At least 1–2 weeks, supplemented with a gentle rinse

After a free gingival or subepithelial connective tissue graft is placed, protecting the graft from mechanical trauma is crucial for revascularization and stable healing. Usually, clinicians advise refraining from direct brushing at the graft site for about 1–2 weeks. Instead, patients often use gentle rinses (chlorhexidine or mild saline) to control plaque. This waiting period prevents accidental displacement or disruption of the fragile graft-tissue interface. Completely avoiding oral hygiene for three months is excessive and can foster plaque accumulation. Brushing vigorously from day 1 can lead to graft damage. Thus, careful guidelines protect the delicate graft.

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191. (B) Early graft necrosis

While mild color changes can occur as a graft revascularizes, a distinctly whitish appearance accompanied by tissue sloughing raises concern for necrosis. This typically arises when the graft lacks adequate blood supply or experiences excessive movement, infection, or trauma. Normal healing usually shows pinkish or light-red coloration with progressive incorporation. Orthodontic relapse and tooth ankylosis are unrelated to the superficial soft tissue. Confirming necrosis requires clinical assessment and possible debridement of necrotic tissue to salvage what remains. An early intervention (e.g., antibiotics if infection is suspected) can sometimes minimize further damage, but the main culprit is insufficient vascularization.

192. (B) Firm, pink adaptation of the graft without mobility

By the second week, a free gingival graft that is integrating well should exhibit a stable appearance—firm and pink, with minimal swelling. This indicates the graft has revascularized, forming a robust attachment to the recipient bed. Conversely, persistent bleeding, sloughing, foul odor, or purulent discharge imply complications such as infection or graft necrosis. Mobility of the graft signals incomplete healing or a disrupted blood supply. Thus, the hallmark of success is the presence of healthy color, reduced inflammation, and a graft that appears affixed to the surrounding gingiva rather than shifting or exuding fluid.

193. (A) Both A and R are true, and R explains A

Free gingival grafts primarily address a lack of keratinized tissue, improving gingival robustness apical to the area of recession. While the graft may slightly elevate the gingival margin, its primary purpose is not comprehensive root coverage (that role is better filled by subepithelial connective tissue grafts or coronally advanced flaps). Because the free graft is often placed in a more apical position to increase the band of attached gingiva, substantial coverage of the exposed root is less likely. Both statements are correct, and the reason accurately clarifies why free grafts rarely yield major root coverage.

194. (B) Suture stabilization if possible and careful monitoring for reattachment

When a graft partially lifts from the recipient bed, immediate removal is not always necessary. If there is enough healthy tissue and an intact blood supply, repositioning and adding or reinforcing sutures can enable healing. The clinician should closely monitor for infection or necrosis. Vigorous brushing could further disturb the graft, while extended antibiotic regimens without signs of infection are unwarranted. Retaining the graft and providing supportive measures (e.g., chlorhexidine rinses, restricted mechanical trauma) allows the wound to stabilize. Prompt intervention to resecure the graft helps salvage healing and minimize further complications.

195. (C) Light digital pressure to evaluate color change and capillary refill in the graft

Graft viability correlates with blood supply and healthy tissue color. By gently applying pressure and observing whether the tissue blanches and then returns to a pink tone, clinicians gauge capillary refill—a vital sign of vascular integrity. If it remains ashen or does not regain normal coloration, necrosis is likely. Histopathological examination might be used after definitive graft removal, but it is not a routine immediate test. Thermal pulp tests assess tooth vitality, not graft health. Bitewing radiographs do not provide soft tissue details. Thus, checking for blanch and refill provides a quick, practical viability measure.

196. (B) Donor site condition and thickness on the palate

When performing a free gingival graft, ensuring that the palatal donor site provides adequate tissue thickness and quality is critical. A graft that is too thin may necrose easily or fail to create a sufficient band of keratinized tissue. Conversely, an excessively thick graft might not revascularize well. Heavy smoking can compromise outcomes, but the question specifically addresses which preoperative factor is most pertinent—selecting an appropriate donor site. Caries on other teeth doesn't directly affect the graft success unless infection spreads, and lacking alveolar bone in the recipient site is not typically a factor for soft tissue grafts.

197. (C) Increasing attached gingiva to enhance plaque control

One of the main goals of a free gingival graft is to widen the band of attached gingiva, particularly when patients struggle with brushing over a mucosa-dominant area. Lacking adequate keratinized tissue, the site may be more susceptible to trauma and inflammation during daily hygiene. By transplanting a graft from the palate, the clinician increases tissue thickness and keratinization, improving patient comfort and plaque control. Although grafting can indirectly stabilize or even reduce pockets, it is not primarily employed to eliminate them or restore alveolar bone. Addressing carious lesions requires restorative or other direct interventions.

198. (B) Better color blend and contour in visible areas

Subepithelial connective tissue grafts excel in areas where aesthetics are paramount—particularly in the anterior region. Because the graft itself is covered by a coronally advanced flap, the final visible tissue primarily comes from the existing gingiva, providing a harmonious color match. In contrast, free gingival grafts bring an epithelial surface from the palate that can appear lighter or thicker in color. While subepithelial grafts do require a palatal donor site, the partial-thickness harvesting approach generally leaves the palatal epithelium intact. Bone recontouring is not an automatic requirement for this technique, and local anesthesia is still needed.

199. (B) Advise thorough but gentle oral hygiene, continue to monitor healing

At two weeks post-surgery, mild swelling and slight bleeding with gentle brushing can be relatively normal for a healing graft site, provided no signs of infection or necrosis appear. Radiographs showing no bony lesions support that underlying structures remain stable. Introducing a second surgery so soon is unwarranted; further healing and tissue maturation can significantly improve coverage. Removing the graft or placing dentures are unnecessary when healthy integration is ongoing. Emphasizing careful plaque removal, perhaps with a soft-bristle brush or specialized technique, avoids damaging the fresh graft. Regular follow-ups ensure the tissues continue to heal successfully.

200. (A) Both A and R are true, and R explains A

Free gingival grafts typically harvest both epithelium and underlying connective tissue from the donor site and are widely used to increase the band of keratinized tissue. Conversely, subepithelial connective tissue grafts isolate the lamina propria to cover recession defects with a coronally advanced flap, often yielding better color matching and cosmesis. The reason behind this difference is that free graft epithelium may stand out if placed in a highly visible region, whereas connective tissue grafts remain beneath the patient's own gingival flap, blending seamlessly. Thus, both statements are true, and the reason accurately clarifies their distinct applications.

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CHAPTER 06

PUBLIC HEALTH DENTISTRY

1. (B) Organized community efforts focused on preventing disease and promoting health

   Public Health is a broad field that aims to safeguard the health of populations through collective action, policy-making, and disease prevention strategies. It goes beyond individual patient care by addressing social determinants of health like sanitation, nutrition, and lifestyle. Choice (A) is too narrow since public health integrates both biology and social factors. Option (C) focuses on curative services but not the wider societal context. (D) is confined to genetic research within families, whereas public health employs large-scale interventions affecting entire communities to foster overall well-being.

2. (C) Assessment

   Public health encompasses three core functions: Assessment, Policy Development, and Assurance. Assessment entails systematically gathering and analyzing data to identify health problems and priorities within a population. This guides decision-makers in designing evidence-based strategies. Policy Development uses the evidence gathered to create guidelines or interventions that address recognized issues. Assurance focuses on ensuring that essential health services are available and effectively delivered. While Implementation is crucial in carrying out interventions, it is not listed as a separate core function. Hence, "Assessment" specifically denotes monitoring population health status.

3. (C) Combining community-based strategies to prevent and control oral diseases on a broader scale

   Dental Public Health is concerned with preventing oral diseases and promoting oral health at a community or population level rather than focusing solely on individual treatment. It integrates epidemiology, community outreach, and policy implementation. Options (A) and (D) are too limited, emphasizing specific age groups or specialized care settings without encompassing broad population strategies. Option (B) narrowly addresses individual therapy, which, while important, is not the sole emphasis of Dental Public Health. A community-wide approach is fundamental, making (C) the most accurate and comprehensive definition.

4. (C) Automated robotic surgeries

   Public Health achievements historically include large-scale immunization drives and breakthroughs in the control of communicable diseases through improved sanitation, hygiene, and antibiotics. Identification of tobacco as a major health risk has led to policies and campaigns to reduce smoking-related illnesses, exemplifying another public health triumph. Automated robotic surgeries, while innovative, are primarily clinical, individual-based advancements in medical technology rather than broad public health measures. Since public health efforts predominantly focus on population-level interventions, (C) does not represent a traditional milestone or framework in the field.

5. (C) Clinical Medicine addresses the health of individuals, whereas Public Health deals with health at the population or community level

   Public Health and Clinical Medicine serve complementary roles. Public Health targets community-wide interventions, policies, and preventive strategies, whereas Clinical Medicine focuses on diagnosing and treating individual patients. Option (A) inverts their respective scopes, while (B) incorrectly assigns social and economic reforms to clinical medicine. (D) overstates the role of laboratory research; although research underpins both fields, it is not their primary activity. Thus, the core difference is that Public Health manages wider population-level issues, while clinical practices emphasize patient-centered care.

6. (C) Directorate General of Health Services (DGHS)

In India, the Directorate General of Health Services (DGHS) plays a pivotal role in formulating and implementing national health programs under the Ministry of Health and Family Welfare. The Indian Medical Association (A) is a professional body representing medical practitioners, while the Central Bureau of Investigation (B) is focused on investigating crimes, not public health. The National Medical Commission (D) oversees medical education and standards. Hence, the DGHS remains the central governmental institution coordinating and guiding large-scale health and preventive measures in the country.

7. (B) Economic, environmental, and social factors influencing population well-being

Social Determinants of Health encompass the conditions in which people are born, grow, work, and age, including socioeconomic status, education, neighborhood, and physical environment. These factors significantly influence health outcomes at both individual and community levels. Genetic predispositions (A) contribute to health but are distinct from broader social determinants. Infectious pathogens (C) can affect health, yet they do not define the broader societal and economic circumstances. Government guidelines (D) relate to regulatory frameworks but do not inherently describe the social context shaping population health.

8. (B) Engaging community stakeholders and oral health professionals

A successful public health campaign for oral disease prevention requires collaboration among policymakers, dental professionals, community leaders, and the public itself. By bringing together various stakeholders, strategies such as fluoridation, oral hygiene education, and access to preventive services can be coordinated effectively. Option (A) is overly focused on clinical interventions. Random use of fluorides (C) lacks structured guidelines and can compromise safety. Avoiding media outreach (D) weakens public engagement, diminishing the impact of the preventive campaign. Thus, inclusive engagement stands as a crucial element.

9. (B) Community water fluoridation program

When a large population segment—especially children—shows high caries rates, a community water fluoridation initiative offers a widespread, cost-effective preventive measure. It benefits everyone consuming the water supply, irrespective of individual socioeconomic status. Option (A) targets the curative side for individuals rather than a population-level intervention. Distributing mouthwashes (C) may help, but coverage might be limited, and compliance can vary. Increasing specialized dental services (D) can help treat cases but does not primarily address prevention. Thus, water fluoridation stands out as the initial, broad-based strategy.

10. (C) Preventive measures can reduce disease incidence and healthcare costs on a larger scale

Dental Public Health emphasizes prevention to decrease the overall burden of oral diseases across communities. By implementing measures such as fluoridation, oral hygiene education, and prophylactic procedures, the incidence of dental caries and periodontal diseases can be substantially lowered. This population-focused strategy often proves more cost-effective than constantly treating advanced conditions at an individual level. Option (A) incorrectly assumes clinical dentistry becomes obsolete, while (B) misrepresents the cost-effectiveness of prevention. (D) is inaccurate as comprehensive preventative efforts aim to protect entire populations.

11. (C) A is true, but R is false

Community interventions are central to Dental Public Health because they address common risk factors such as poor oral hygiene, suboptimal fluoride exposure, and inadequate nutrition. While individual restorative procedures can repair damage, they do not fully mitigate broader social and behavioral determinants driving oral disease at a population scale. The assertion correctly highlights the public health approach's emphasis, but the reason is inaccurate in implying that only restorations can mitigate widespread risk factors. Hence, (C) is correct because A is true and R is false.

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12. (A) Primary Prevention

Primary prevention aims to avert the onset of disease before it occurs. Applying pit-and-fissure sealants to children's molars falls under this category because it protects against caries development from the outset. Secondary prevention (B) targets early detection and treatment to halt progression, while tertiary prevention (C) focuses on reducing the impact of established disease (e.g., rehabilitative therapies). Quaternary prevention (D) addresses preventing over-medicalization. Sealants serve as a direct, prophylactic measure, preventing plaque accumulation and carious lesions, clearly placing the approach in the primary prevention framework.

13. (B) Public education campaigns on limiting sugary snacks

High sugar intake is a central driver of caries development, as oral bacteria metabolize sugars to produce acids that demineralize enamel. By educating communities on healthy dietary habits, individuals become aware of sugar's detrimental effects and make informed choices to reduce consumption. Fluoride mouth-rinses (A) strengthen teeth but do not address sugar intake. Providing free restorations (C) and dentures (D) is more of a curative or rehabilitative measure, not a preventive method targeting sugar consumption. Consequently, public awareness campaigns directly tackle the cause-effect pathway.

14. (B) Educating local healthcare workers to deliver basic oral health instruction and fluoride toothpaste

When addressing oral health in under-resourced areas, empowering local healthcare workers proves cost-effective and sustainable. These workers can educate the community on hygiene practices, the importance of fluoride, and healthy dietary choices. Weekend visits by private practitioners (A) may be too limited in frequency and capacity. Building a specialized hospital (C) is expensive and may not be the immediate solution for preventive coverage. Offering root canal therapy (D) addresses existing disease but fails to prevent new cases. Empowering community-level staff best meets preventive needs.

15. (B) Detecting disease in its early stages and intervening to halt progression

Secondary prevention involves early detection and prompt intervention to curtail disease advancement. Within dentistry, examples include screening for early dental caries or gingivitis and delivering timely restorative or prophylactic treatments. Option (A) aligns more with tertiary prevention, which addresses advanced conditions. Option (C) describes primary prevention, which attempts to prevent disease from arising. Option (D) is broader than the standard definition of secondary prevention, emphasizing complete pathogen removal, which is more characteristic of epidemic control measures. Thus, early detection and intervention define secondary prevention.

16. (B) Primary prevention stops disease before it starts; tertiary prevention reduces complications of advanced disease

Primary prevention aims to avoid disease onset altogether, exemplified by measures such as community water fluoridation and sealant application. In contrast, tertiary prevention targets minimizing the impact of established oral diseases (e.g., advanced periodontal therapy, prosthodontic rehabilitation). Option (A) incorrectly attributes screening to primary prevention—screening typically falls under secondary prevention. Options (C) and (D) do not reflect the broader goals of prevention at different stages. Therefore, the key difference is that primary prevention addresses pre-disease stages, while tertiary prevention addresses post-disease management.

17. (B) Comprehensive rehabilitation with dentures or implants

Tertiary prevention aims to restore function and improve quality of life after significant disease progression. Dentures, implants, or other restorative procedures for severely damaged teeth are quintessential tertiary interventions. Fluoride varnish applications (A) and screening for early lesions (C) are primary and secondary preventive measures, respectively. Nutritional counseling (D) is primarily a primary prevention strategy, designed to reduce the initial occurrence of disease. Therefore, comprehensive rehabilitation with prostheses or implants specifically aligns with tertiary prevention

by addressing substantial tooth loss or advanced oral health deterioration.

18. (B) Sealing and protecting pits and fissures from bacterial colonization

Dental sealants protect occlusal surfaces of teeth—especially in children—by covering pits and fissures, thus blocking bacterial penetration and accumulation. They do not remineralize enamel (A), which is more associated with fluoride. Neither do they remove carious dentin (C) or replace missing teeth (D). Instead, by preventing food debris and bacteria from settling in the tooth's anatomical grooves, sealants serve as a simple yet effective prophylactic measure, particularly when applied soon after tooth eruption. Hence, their key protective action is physically sealing occlusal surfaces.

19. (C) Subsidizing candies to encourage daily sugar intake

Primary prevention strategies aim to reduce the incidence of oral diseases. Encouraging sugar consumption is contrary to preventing dental caries, as sugar intake fuels cariogenic bacteria. Regular dental check-ups (A) help identify early lesions and reinforce healthy habits. Water fluoridation (B) has been proven to lower caries prevalence at the population level. Oral health education (D) raises awareness and modifies risk behaviors. Hence, subsidizing candies (C) is counterproductive to all primary prevention goals and would be an incorrect step in such programs.

20. (A) Primary Prevention

Providing free toothbrushes and fluoride toothpaste facilitates regular oral hygiene practices, preventing the initial onset of caries and periodontal issues. Secondary prevention (B) addresses early detection and treatment of existing disease. Tertiary prevention (C) aims to rehabilitate those with advanced oral conditions. While distributing these supplies may indirectly support diagnosis by keeping oral tissues healthier, it is not a diagnostic screening measure (D). Ultimately, this measure targets reducing new occurrences of oral diseases by promoting routine preventive habits, fitting the definition of primary prevention.

21. (B) Launching a community-wide oral hygiene education and plaque control campaign

Periodontal diseases are strongly linked to inadequate plaque control, poor oral hygiene practices, and various lifestyle factors. A widespread educational campaign that emphasizes brushing techniques, flossing, and regular check-ups can greatly reduce periodontitis prevalence. Although free scaling camps (A) and specialized periodontists (D) provide care, they typically address problems after they arise and may not be accessible for the entire population. Gum surgeries (C) similarly handle advanced disease rather than preventing it. Therefore, a comprehensive preventive campaign targeting plaque control is more impactful.

22. (B) Apply fluoride varnish and offer oral hygiene instruction

In this scenario, mild gingivitis and early carious changes can often be managed with preventive interventions. Fluoride varnish helps strengthen enamel, reducing lesion progression. Simultaneously, teaching proper brushing and flossing encourages plaque removal and healthier gingival tissues. Immediate referral to tertiary care (A) is unwarranted at this mild stage. Root canal therapy (C) is excessive for early carious lesions. An orthodontic consultation (D) might be relevant in cases with malocclusion but does not address the immediate preventive needs. Hence, fluoride application plus education is the logical approach.

23. (D) Empower communities to participate in identifying and solving oral health problems

Public Health Dentistry depends on community collaboration to identify prevalent oral health issues and devise solutions. This approach promotes ownership, sustainability, and culturally appropriate interventions. Option (A) contradicts the preventive, broad-based orientation of public health. Waiting for widespread disease (B) is counterproductive, as early identification and prevention are central. Purely top-down information delivery (C) neglects community engagement, which is essential for sustained behavioral changes. Consequently, empowering communities fosters more effective and long-lasting outcomes by acknowledging local contexts and ensuring participants are active agents.

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24. (B) Educating and enabling individuals and communities to improve their oral health

Health Promotion in the dental context includes systematic efforts to support individuals and communities in adopting healthier lifestyles. This comprises oral hygiene instruction, nutritional guidance, and access to preventive measures such as fluoride. It also encourages policies that make healthy choices more accessible and affordable. Merely offering emergency treatments (A) or providing cosmetic procedures (C) does not represent broader health promotion. Restricting public involvement (D) opposes the participatory principle crucial for sustainable health improvements. Hence, health promotion is about empowerment and proactive engagement for overall well-being.

25. (A) World Health Organization (WHO)

The World Health Organization (WHO) provides this holistic definition of health, emphasizing that health encompasses more than the absence of disease. The CDC (B) focuses on protecting the health and safety of Americans, UNESCO (C) concentrates on education and culture, and the NIH (D) conducts biomedical research. While all these bodies contribute to global well-being, it is specifically WHO that introduced and popularized the definition highlighting physical, mental, and social dimensions, thereby framing the foundation for comprehensive healthcare policies and interventions worldwide.

26. (B) Prevent, arrest, and control oral diseases at both individual and community levels

Preventive Dentistry is designed to avert the onset of dental diseases, halt their progression, and control existing conditions before they worsen. This encompasses routine check-ups, hygiene education, application of fluoride, and other population-level initiatives. Restricting focus to complex surgeries (A) or waiting until severe pathology emerges (C) contradicts the preventive model. Emphasizing cosmetic enhancements (D) overlooks the functional and health-related priorities fundamental to dentistry. Thus, the overarching purpose is to shield patients and communities from oral diseases and complications.

27. (C) Mass education on oral hygiene practices

Primary prevention aims to stop disease from arising by addressing risk factors. Mass education campaigns encourage brushing, flossing, and dietary modifications—key steps that block disease onset. Screening for lesions (A) is a secondary preventive approach, as it detects disease early. Dentures (B) represent tertiary prevention, dealing with rehabilitating advanced tissue loss. Restorative procedures (D) also form part of secondary or tertiary interventions, depending on disease stage. Therefore, (C) is the clearest illustration of a primary prevention strategy in oral health programs.

28. (C) Promotion of excessive sugary snacks

Public health measures typically involve reducing caries risk factors and enhancing protective factors. Water fluoridation (A), oral health education (B), and school-based brushing programs (D) directly reduce caries incidence and severity. Encouraging excessive sugar consumption (C) is counterproductive to caries prevention, as fermentable carbohydrates fuel acidogenic bacteria, leading to demineralization of tooth enamel. Hence, among the listed choices, promoting sugary snacks contradicts caries-preventive strategies and stands out as the exception.

29. (A) Primary prevention involves using fluoride to strengthen sound teeth, while secondary prevention targets early incipient lesions

In Preventive Dentistry, fluoride has multifaceted uses. When used in sound teeth—via drinking water, toothpaste, or varnish—to thwart caries onset, it represents a primary preventive measure. For incipient (early) lesions, fluoride application aids remineralization, halting disease progression, thereby functioning as secondary prevention. (B) is incorrect since primary and secondary prevention address different disease stages. (C) erroneously claims fluoride is exclusive to secondary prevention. (D) confuses restorative dentistry with fluoride's prophylactic and remineralizing roles. Thus, the distinction lies in preventing new lesions versus stopping early lesions.

30. (B) Community water fluoridation

Community water fluoridation is considered one of the most cost-effective methods to reduce dental

caries on a population scale. It ensures consistent fluoride exposure for all residents who consume the fluoridated water. While a mobile dental clinic (A) can provide important curative services, it addresses existing disease and often has limited coverage. Crowns and bridges (C) are rehabilitative, targeting advanced damage. Monthly extractions (D) manage end-stage disease rather than preventing it. Thus, water fluoridation stands out as the broad-reaching primary preventive measure for children.

31. (C) A is true, but R is false

Fluoridation is an accepted public health measure to prevent caries, as optimal fluoride levels significantly reduce decay rates across populations. While overexposure to fluoride can lead to dental fluorosis, this risk is mitigated by careful monitoring and regulation of fluoride concentration in public water supplies. Hence, the Reason (R) is false because fluoridation is indeed recommended at the community level, provided it is well-regulated. The Assertion (A) is correct, making (C) the accurate choice.

32. (C) Integrating oral health education into school curricula

In low-resource settings, embedding oral health education into school programs ensures that children learn preventive behaviors from an early age, fostering habits that persist into adulthood. Weekly professional cleanings (A) may not be feasible due to limited personnel and funding. High taxes on fluoride toothpaste (B) can reduce access for the most vulnerable, hampering prevention efforts. Restricting toothbrush distribution to private clinics (D) also limits coverage. Thus, a broad educational approach within schools is both practical and effective for tackling early childhood caries.

33. (B) Imposing taxes or restrictions on sugary drinks while promoting healthier alternatives

Caries prevalence is closely linked to sugar intake. By implementing policies that raise the cost or limit the availability of high-sugar drinks and simultaneously educate or subsidize healthier beverage options, the community can curb the root cause of increased caries incidence. Extraction camps (A) and advanced periodontal (C) or restorative treatments (D) address consequences rather than preventing new cases. Thus, targeting sugary beverage consumption through fiscal and educational interventions helps break the cycle of high sugar intake fueling bacterial acid production leading to caries.

34. (B) Universal basic coverage of affordable fluoride toothpaste

WHO recommends ensuring populations have access to preventive tools, such as fluoride toothpaste, to reduce oral disease prevalence. This aligns with the broader goal of making essential healthcare interventions both affordable and widely available. Completely forbidding sugar (A) is impractical and does not reflect official guidelines. Invasive cosmetic procedures (C) do not address root causes of oral diseases. Restricting education on brushing (D) conflicts with the fundamental preventive principles advocated by WHO. Hence, making fluoride toothpaste accessible remains a cornerstone for global oral health improvement.

35. (B) Ongoing training of village health workers on oral hygiene and fluoride use

For a lasting impact, empowering local health workers is crucial. Regular training equips them with the knowledge and skills to educate residents, conduct basic preventive measures, and provide timely referrals. While high-tech toothbrushes (A) or occasional dentist visits (C) may offer short-term benefits, they fail to embed long-term capacity in the community. A specialized hospital (D) might be unsustainable if staffing and maintenance costs exceed local resources. Therefore, training local health personnel stands out as the most viable strategy to maintain preventive dental care.

36. (C) Apply sealant or fluoride to arrest lesion progression

Early or incipient pit-and-fissure lesions often respond well to preventive interventions. Using sealants or high-concentration fluorides can halt or reverse enamel demineralization by blocking bacterial invasion and enhancing remineralization. Extraction (A) is overly aggressive, and watchful waiting (B) risks lesion expansion into dentin. A full-coverage crown (D) is typically reserved for more extensive structural damage. Therefore, sealing or treating the incipient area with fluoride

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helps preserve the tooth structure and prevents further deterioration, aligning with the principle of minimal intervention dentistry.

37. (C) Providing extensive full-mouth reconstructions at early stages

Minimal intervention dentistry emphasizes detecting early lesions, promoting remineralization, and implementing conservative measures like sealants to prevent disease progression. Extensive reconstructive procedures (C) involve significant tooth preparation, typically reserved for advanced lesions that cannot be managed by conservative therapy. Early detection (A), fissure sealants (B), and fluoride application (D) embody the core principles of preserving healthy tooth structure and preventing further breakdown. Thus, large-scale reconstructions run contrary to the minimal intervention model and represent the exception.

38. (B) Launch a comprehensive school-based brushing and oral hygiene education program

Early gingivitis is predominantly reversible if addressed through proper oral hygiene measures. A systematic school-based brushing initiative, combined with instruction on correct techniques and dietary counseling, can reverse inflammation and significantly reduce progression to periodontal disease. Referring only severe cases (A) excludes the vast majority who can benefit from preventive measures, while prosthetic treatments (C) are unnecessary for gingivitis. Eliminating follow-up (D) undermines continuous improvement. Hence, a community-level brushing and hygiene initiative is the most appropriate next step for large-scale impact.

39. (B) Teaching effective brushing and flossing to prevent plaque accumulation

Primary prevention for periodontal diseases centers on preventing plaque buildup and subsequent inflammation. This involves instructing patients in effective brushing and flossing techniques, often supplemented by professional advice on lifestyle factors. Identifying calculus (A) is more diagnostic, often linked to secondary prevention once early changes occur. Surgical and reconstructive procedures (C, D) are typically tertiary measures aimed at restoring function and aesthetics after significant periodontal breakdown. Consequently, the foundational measure to stop periodontal disease onset is thorough daily plaque control.

40. (B) Advise daily high-fluoride toothpaste and routine brushing

In a non-fluoridated region, a child with early carious lesions benefits significantly from enhanced fluoride exposure to promote remineralization. Using high-fluoride toothpaste, paired with diligent brushing, can prevent lesion progression. Recommending sugar (A) raises caries risk. Deferring intervention (C) risks further enamel deterioration, while prosthodontic measures (D) are unwarranted and invasive for a child with incipient caries. By boosting fluoride usage and reinforcing oral hygiene habits, families can effectively mitigate early decay and bolster enamel's resilience.

41. (C) It offers uniform caries prevention benefits across socioeconomic statuses

Fluoridating a community's water supply provides access to caries-preventing fluoride regardless of individual income, educational level, or healthcare access, thus promoting health equity. It helps reduce dental disparities by ensuring widespread preventive coverage, especially beneficial to lower-income populations who may face barriers to regular dental care. Option (A) is incorrect since the measure supports everyone in the fluoridated area. It does not specifically target edentulous individuals (B). Furthermore, fluoridation complements, rather than replaces, personal oral hygiene practices (D). Hence, uniform benefit is the key advantage.

42. (C) Prophylaxis

Prophylaxis in dentistry encompasses preventive measures designed to avert disease onset. This can involve professional cleanings, application of topical fluorides, pit-and-fissure sealants, and patient education on effective oral hygiene. A curative approach (A) addresses established disease, while palliative care (B) aims to alleviate discomfort in conditions that are often terminal or incurable. Tertiary rehabilitation (D) focuses on advanced interventions after significant disease progression, such as prosthetic solutions. Prophylaxis, thus, is most closely associated with preventing oral diseases proactively.

43. (C) Fortification of public water supplies with fluoride

The fortification or fluoridation of public water supplies is a widely recognized primary preventive measure to lower caries prevalence. This intervention is cost-effective and reaches broad segments of the population. While public insurance (A) can improve access to dental care, it does not primarily focus on preventing disease onset. Orthodontic treatments (B) address malocclusions rather than preventing caries. Mass extractions (D) are a reactive measure, neither conservative nor preventive. Therefore, water fluoridation is the classic example of a large-scale, government-led initiative to prevent dental caries.

44. (A) Implementing a basic screening and referral system using trained health workers

When advanced resources are scarce, training local health workers to conduct basic oral checks allows early detection of lesions like incipient caries or gingivitis. Those identified can be referred for professional care when necessary. Constructing a costly, high-tech facility (B) is impractical in resource-limited areas. Delaying checks until sophisticated tools are available (C) fosters disease progression. Solely providing prosthetic solutions (D) addresses severe stages rather than preventing or intercepting early disease. Thus, a simple, structured screening and referral mechanism is the most appropriate management step.

45. (A) Both A and R are true, and R is the correct explanation of A

Dental caries and gingivitis share key etiological factors, chiefly plaque buildup facilitated by inadequate oral hygiene and sugar-rich diets. Improving oral hygiene routines—through better brushing technique, interdental cleaning, and nutritional advice—directly diminishes microbial colonies and reduces acid formation. This lessens both carious lesions and gingival inflammation. Therefore, the Assertion is true, and the Reason correctly explains why better hygiene correlates with lower disease incidence in the population. Proper prevention strategies thus revolve around effective plaque control and dietary management.

46. (C) Providing sugary snacks at the brushing demonstration to test new skills

A community-focused plaque control initiative aims to reduce dietary sugar intake and instruct effective plaque-removal methods. Offering sugary snacks during an oral hygiene demonstration contradicts the program's preventive message. Encouraging fluoride toothpaste usage (A), teaching proper flossing (B), and involving parents in children's oral routines (D) are all valid actions that reinforce good habits. By contrast, distributing sweets at a demonstration might confuse participants and undermine the emphasis on limiting sugar consumption, making it the incorrect step.

47. (B) Periodically once permanent teeth start to erupt

Fluoride varnish is recommended as soon as permanent teeth begin to erupt to protect them from demineralization and reduce caries risk. Waiting until significant tooth loss (A) misses the preventive window. Restricting application to advanced disease stages (C) overlooks its greatest benefit, which is preventing early lesions from progressing. Tying varnish applications solely to zero sugar intake (D) is unrealistic and overlooks environmental risks. Therefore, routine periodic applications from the time permanent teeth emerge aligns with established preventive dentistry protocols.

48. (B) Water fluoridation, nutritional counseling, and fluoride toothpaste distribution

The scenario indicates multiple risk factors: no fluoridation, high sugar frequency, and poor hygiene. Addressing these comprehensively ensures maximum preventive impact. Implementing community water fluoridation helps reduce overall caries susceptibility, while nutritional counseling targets frequent snacking habits. Distributing fluoride toothpaste encourages daily plaque control. Providing crowns (A) or treating established caries (C) merely resolves individual damage but does not systematically reduce future incidence. Sporadic camps (D) lack sustained oversight. Hence, combining fluoridation, dietary modification, and routine fluoride use meets the community's broader needs.

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49. (B) Initiate a structured dietary modification and oral hygiene reinforcement plan

The patient's early signs of caries and moderate gingivitis are largely rooted in inadequate oral hygiene and frequent snack consumption. Educating her on balanced diets and improved hygiene routines—like brushing twice daily and possibly adding floss or interdental brushes—can reverse early lesions and reduce gum bleeding. Immediate extractions (A) or root canals (C) are not warranted unless more severe pathology is confirmed. Merely giving painkillers (D) neglects the underlying causes. Hence, focusing on preventive strategies through diet and hygiene education is key.

50. (C) Introduce gentle brushing technique, reduce sugary snacks, and use fluoride mouthwash

Cervical abrasions and gingival recession may be due to improper brushing technique, and frequent sweet snacks elevate caries risk. By educating the patient on a gentler brushing method, encouraging reductions in sugar intake during tea breaks, and incorporating fluoride mouthwash, the patient can protect exposed cervical areas and minimize plaque accumulation. Dentures (A) and frequent extractions (D) are excessive interventions. Prosthodontic referral (B) may eventually help with advanced recession or tooth wear but does not primarily prevent further lesions. Hence, a targeted preventive strategy is ideal.

51. (A) Decayed, Missing, and Filled Teeth

The DMFT index is a widely used measure to assess caries experience in permanent teeth. Each tooth is evaluated to see whether it is decayed, missing due to decay, or filled because of a previous lesion. By summing these components, researchers gain insights into a population's overall caries burden and treatment history. This index helps track disease trends and evaluate the effectiveness of preventive programs. Options (B) and (C) are unrelated to the standard usage of DMFT, while (D) misconstrues the scope of the index.

52. (C) 35–44 years

According to World Health Organization (WHO) guidelines, the 35–44 age group is often considered the "standard" adult age range for comparing oral health across populations, especially regarding caries prevalence measured by DMFT. This group represents an adult working population that has been exposed to various risk factors over time, providing a reliable snapshot of disease patterns. Younger children (B) and older adults (D) can also be examined, but they are typically used for different indices or specialized surveys. Option (A) is too young for a full DMFT assessment.

53. (B) The def index evaluates deciduous teeth, while DMFT focuses on permanent teeth

In child dental epidemiology, the def index (decayed, extracted due to caries, and filled primary teeth) is employed to assess caries in primary dentition. Meanwhile, DMFT is used to measure caries experience in permanent dentition. This distinction is crucial because primary teeth have different susceptibility, eruption patterns, and influences on child oral health than permanent teeth. Option (A) incorrectly suggests the def index evaluates only calculus. Option (C) misplaces its application to geriatric research. Option (D) overlooks the distinct uses of these two complementary indices.

54. (D) Coronal caries lesions

The Community Periodontal Index (CPI), formerly known as the CPITN (Community Periodontal Index of Treatment Needs), primarily focuses on periodontal health. It records indicators such as gum bleeding, calculus accumulation, and probing depth to classify periodontal status. Coronal caries (D) is not included as a criterion in the CPI; caries is typically measured by indices like DMFT or def. Therefore, while CPI helps evaluate periodontal conditions at the population level, it does not document the presence or extent of carious lesions.

55. (B) It measures plaque and calculus on selected tooth surfaces to determine oral hygiene status

The Simplified Oral Hygiene Index (OHI-S) assesses the cleanliness of teeth by scoring plaque and calculus on specific index teeth. This measure offers a quick overview of an individual's or a population's oral hygiene levels. By examining the surfaces where deposits commonly accumulate, public health professionals can gauge the effectiveness of brushing habits and oral hygiene interventions. Malocclusion (A) is evaluated through distinct criteria. Gingival recession (C)

is not covered by OHI-S. Fluoride uptake (D) is unrelated to this index, which focuses on deposits.

56. (C) Plaque Index (Silness and Löe)

The Plaque Index by Silness and Löe focuses explicitly on the thickness of plaque at the gingival margin of designated teeth. This index assigns a score based on the visual amount of plaque, guiding both research and clinical practice in evaluating oral hygiene. Greene and Vermillion's OHI-S (A) combines plaque and calculus scores, while the Gingival Index (B) measures gingival inflammation rather than direct plaque amount. Periodontal Screening and Recording (D) is a quick method to assess overall periodontal health, not specifically plaque presence.

57. (C) A is true, but R is false

DMFT stands for Decayed, Missing, and Filled Teeth, reflecting both untreated decay (D) and evidence of treatment (F). Additionally, Missing teeth (M) may indicate severity. By examining these components, researchers detect levels of unmet need (decay) and adequacy of interventions (fillings). Thus, the assertion is correct: DMFT does reveal both treated and untreated caries. The reason is false because fillings (F) are indeed part of the index, contradicting the statement that DMFT excludes restorations. Hence, A is true, and R is false.

58. (A) Dean's Fluorosis Index

Dean's Fluorosis Index is the standard tool for grading the severity of dental fluorosis. It categorizes enamel changes, from mild white opacities to more severe pitting or brown stains. The Gingival Bleeding Index (B) tracks gum health, not enamel changes. CPI (C) centers on periodontal status, measuring pocket depth, calculus, and bleeding. The OHI-S (D) focuses on plaque and calculus accumulation. Hence, Dean's Index remains the recognized measure for evaluating fluorosis prevalence and severity in epidemiological surveys.

59. (D) Measuring the DMF status during the same probing

The CPI is designed specifically to evaluate periodontal conditions, assessing bleeding, calculus, and pocket depth in each sextant using a WHO probe. Combining it with DMF data within the same probing step conflates distinct indices. DMF (Decayed, Missing, Filled) focuses on caries experience, requiring separate visual or radiographic evaluations. While both measures may be used in a single epidemiological survey, they are recorded independently. Steps (A), (B), and (C) align with CPI protocols, making (D) the incorrect step in standard field application.

60. (A) DMFT and CPI

DMFT (Decayed, Missing, Filled Teeth) comprehensively measures caries experience in permanent dentition, showing both untreated decay and treated lesions. The Community Periodontal Index (CPI) evaluates periodontal status, examining bleeding, calculus, and pocket depth. Using these two indices together offers a dual overview of oral health, capturing both caries and periodontal conditions. The Plaque Index and Dean's Index (B) address plaque and fluorosis, respectively. The Gingival Index plus def (C) focuses on gingival inflammation and primary teeth caries. OHI-S and Gingival Bleeding Index (D) lack direct measurement of caries.

61. (B) Simplified Oral Hygiene Index- Calculus Component (OHI-S - Calculus)

The OHI-S by Greene and Vermillion has two components: the Debris Index (DI-S) for plaque and the Calculus Index (CI-S) for calculus. By recording the presence and extent of calculus on index teeth, the Calculus Index produces a distinct score that helps evaluate oral cleanliness. The Turesky-Gilmore-Glickman modification (A) primarily refines plaque scoring. Bleeding on Probing Index (C) gauges gingival bleeding, while the Papillary-Marginal-Attachment Index (D) monitors gingivitis severity. Therefore, the OHI-S Calculus component is specifically dedicated to measuring calculus accumulation.

62. (C) An increased need for periodontal treatment

The Community Periodontal Index (CPI) classifies sextants based on factors like bleeding, calculus, shallow pockets, and deep pockets. Higher scores typically signal more advanced periodontal involvement and a corresponding increase in treatment requirements. For example,

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a CPI code 3 or 4 indicates pockets that demand further professional care and possibly advanced periodontal therapies. Reduced calculus prevalence (A) and minimal pockets (B) would produce lower CPI scores, while improvement in oral hygiene (D) would similarly reduce these scores. Thus, a high CPI unequivocally correlates with greater treatment needs.

63. (B) Providing a systematic way to assess and quantify oral health conditions

Dental indices, such as DMFT, CPI, or OHI-S, enable uniform data collection across varied populations, ensuring results are comparable and reproducible. By scoring specified conditions—for instance, decayed teeth or periodontal pockets—researchers gain quantifiable measures of oral health or disease burden. Option (A) incorrectly characterizes an index as a random generator, while (C) discards clinical objectivity. Aesthetic considerations (D) may factor into some evaluations but are not the primary function of indices. Thus, the fundamental purpose is to systematically gauge prevalence and severity of specific oral conditions.

64. (C) A is true, but R is false

The def index (decayed, extracted due to caries, filled) applies to primary or deciduous teeth, making it vital for assessing children's oral health before their permanent dentition emerges fully. This ensures early identification of caries trends and timely interventions. The reason statement, however, is inaccurate because "def" specifically references primary teeth, not permanent teeth. Therefore, while it remains indispensable in pediatric surveys, it does not focus on permanent dentition, which is covered by DMFT. Hence, the Assertion is correct, and the Reason is incorrect.

65. (A) Training examiners with a standardized protocol and calibrating them

Consistency in data collection and scoring across numerous examiners is critical for reliable survey outcomes. Standardized training ensures each index—be it DMFT, CPI, or OHI-S—is applied consistently, while calibration exercises help minimize inter-examiner variability. Allowing personal judgment (B) or keeping guidelines flexible (C) leads to inconsistent data. Self-reports (D) can be subject to recall bias and inaccuracies, lacking the clinical confirmation needed in epidemiological research. Therefore, carefully calibrating examiners stands as the best method to attain accurate, reproducible findings when multiple indices are employed.

66. (A) An investigation observing a single population at one point in time

A cross-sectional survey examines the prevalence or characteristics of a particular condition or behavior in a defined group at a specific moment. This approach provides a snapshot of oral health status, identifying factors such as caries prevalence or periodontal conditions within that population. Longitudinal methods (B) track changes over time. Clinical trials (C) and randomized controlled trials (D) typically focus on comparing interventions or treatments, rather than mapping a single point health status. Consequently, cross-sectional studies remain a fundamental design in oral health epidemiological surveys.

67. (B) Random sampling

Random sampling ensures each individual in the target population has an equal probability of selection, reducing selection bias and increasing the likelihood that the sample reflects the entire group's true characteristics. Convenience sampling (A) relies on easily accessible participants, risking skewed results. Judgmental sampling (C) selects based on the researcher's judgment, potentially introducing personal bias. Snowball sampling (D) is used when participants recruit future subjects from among their acquaintances, which can be useful for hidden populations but may compromise generalizability. Therefore, random sampling best provides representativeness in oral health surveys.

68. (B) It enrolls participants at baseline and follows them over time to observe outcomes

A prospective cohort study tracks a group of initially disease-free individuals from the start (baseline) through a specified period, monitoring them for the development of outcomes like caries or periodontal disease. This design helps establish temporal relationships between risk factors (e.g., sugar consumption) and subsequent disease. Cross-sectional studies (A) assess data at a single

time, offering no timeline of cause and effect. Option (C) also applies to cross-sectional designs. Random assignment to interventions (D) describes a randomized controlled trial. Hence, cohort studies inherently involve forward-looking observation.

69. (C) Implementing a purely subjective scoring method with no calibration

Conducting a robust oral health survey involves multiple carefully planned steps: clearly stating goals, choosing a representative sample, and employing validated tools like standardized indices to collect data consistently. Calibration of examiners ensures reliability and comparability of results. A purely subjective approach lacking standard procedures or calibration (C) undermines the survey's credibility, as it increases the risk of bias and inaccuracies. Thus, (C) stands out as the incorrect or non-essential practice in an otherwise methodical survey design process.

70. (B) To identify any ambiguity or errors in the questionnaire before the main study

Pilot testing ensures the survey questions are clear, relevant, and correctly interpreted by participants. Any confusing wording, excessive length, or technical issues can be rectified ahead of the larger study, thus reducing data-collection errors and respondent burden. Option (A) is incorrect because publication should follow rigorous data analysis. Recruiting a larger sample (C) is not the pilot's role—pilots typically involve a small sample. Ethical clearance (D) is crucial in research, so the pilot does not negate that responsibility. Consequently, pilot testing optimizes the survey instrument's clarity and reliability.

71. (B) Longitudinal randomized controlled trial

A randomized controlled trial (RCT) is the gold standard for determining causality and efficacy of interventions. By randomly assigning participants to either the new mouthrinse group or a control/placebo group, researchers can track plaque changes over time while minimizing bias. Cross-sectional surveys (A) only provide a snapshot, lacking follow-up. Case-control studies (C) compare those with and without the outcome retrospectively, which is less ideal for testing a preventive agent prospectively. Ecological studies (D) examine population-level data without individual-level interventions or randomization, making them less precise for efficacy evaluations.

72. (B) Case-control studies identify subjects based on outcome status and look back at exposures, while cohort studies track exposures first and look forward to outcomes

In a case-control design, researchers select individuals who already have the outcome (cases) and those who do not (controls), then assess prior exposures like tobacco use. This retrospective approach helps identify potential factors contributing to the disease. A cohort study, however, enrolls individuals based on exposure status (e.g., tobacco usage) and observes them prospectively to see who develops oral cancer. They differ in design, timeline, and the strength of causal inferences. Both randomization (D) and identical evidence levels (C) are incorrect, as randomization typically characterizes experimental rather than observational studies.

73. (B) A systematic error that skews study results away from truth

Bias refers to any non-random, consistent deviation from accuracy in a study's methodology or interpretation. It can arise from sample selection, measurement inconsistencies, or even data analysis techniques. Unlike random errors, biases systematically misrepresent the true relationship being studied, compromising the validity of findings. A statistical test (A) or gold standard measure (D) serves entirely different purposes in research. Random variation (C) contrasts with bias, as randomness does not systematically favor one outcome. Therefore, bias is a methodical distortion, undermining reliable results.

74. (B) Define a clear research question

Establishing a well-defined research question guides every subsequent step in a study. Before analyzing data or distributing interventions, researchers must articulate the precise aim, such as investigating the relationship between dietary factors, fluoride exposure, and caries prevalence. This clarity forms the foundation for selecting an appropriate study design, sampling strategy, and measurement tools. Existing data might be relevant, but even

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that analysis should be driven by a well-structured query. Similarly, implementing preventive measures or performing statistical analysis prematurely might lack direction. Hence, clarifying the research question is paramount.

75. (D) A is false, but R is true

Standardized indices—like DMFT, CPI, and OHI-S—are indispensable in large-scale surveys because they allow consistent data gathering, enabling comparisons between different regions or times. This standardization forms the backbone of epidemiological research, ensuring that measurements of caries, periodontal health, or oral hygiene remain objective and reproducible. The assertion (A) that using standardized indices is optional is incorrect, as recognized guidelines recommend their mandatory use to maintain research integrity. The reason (R) is valid because standardized protocols indeed boost both reliability and comparability of results across diverse populations.

76. (C) Conduct examiner calibration sessions with standardized guidelines and trial examinations

Calibration workshops enable examiners to practice applying the same indices and scoring criteria on sample subjects. Discrepancies can be identified and corrected early, ensuring uniform measurement across all sites. Having each examiner create personal scoring systems (A) or providing only written instructions (B) fosters inconsistent results. Likewise, ignoring variability (D) is dangerous, since even minor differences in scoring can significantly distort epidemiological data. Thus, organized calibration sessions remain the best strategy to assure consistent, reliable assessments among multiple examiners.

77. (B) Deploying globally accepted standardized indices for data collection

The World Health Organization recommends using validated and standardized indices (e.g., DMFT, CPI) to enable cross-country comparisons and identify international trends in oral health. By maintaining uniform protocols, data remain consistent, facilitating better policy formulation and resource allocation. Restricting to urban areas (A) or ignoring clinical exams (C) can yield biased or incomplete insights, while neglecting examiner calibration (D) promotes variability. Hence, employing robust, universally recognized indices stands as a central WHO requirement for credible, comprehensive national surveys.

78. (C) Increased risk of measurement bias

Inconsistency in examination criteria causes examiners to apply varying thresholds for diagnosing conditions like caries or periodontal diseases, leading to skewed or non-comparable data. This misalignment inflates measurement bias, as the true disease prevalence might be overestimated or underestimated. Accuracy (A) and reliability (D) are actually diminished, and comparability (B) deteriorates when multiple sets of criteria are used. Hence, standardizing clinical protocols is essential to reduce bias, thereby reinforcing the quality and trustworthiness of survey findings.

79. (C) Qualitative methods explore perceptions and contexts, while quantitative methods measure numerical outcomes

Qualitative research delves into subjective experiences, beliefs, and social contexts, often using open-ended interviews, focus groups, and observational techniques to gather in-depth insights. In contrast, quantitative research utilizes standardized instruments and statistical analyses to measure and compare numerical data, such as caries prevalence or plaque scores. Option (A) inverts the definitions, while (B) is incorrect, as quantitative approaches typically use structured questionnaires. Although some forms of research are observational, it is not accurate to label both methods as entirely unstructured. The key distinction lies in the nature of data collected.

80. (C) Cohort

The scenario outlines a prospective approach where a group of individuals (tobacco users) is followed over a set duration to record the onset of specific outcomes (oral lesions), and results are contrasted against a non-exposed group. This structure exemplifies a cohort study, allowing assessment of incidence rates and potential risk relationships. A cross-sectional study (A) would evaluate both exposure and outcome at one point, while a case-control study (B) retrospectively

compares individuals with and without the disease. An ecological study (D) would not track individuals but rather population-level data.

81. (B) A structured initiative involving preventive, educational, and sometimes curative dental services within the school environment

A School Oral Health Program aims to promote good oral hygiene habits, identify dental issues early, and provide interventions among schoolchildren. Such programs often include routine screenings, fluoride applications, oral hygiene instruction, and, when possible, minor restorative treatments on-site. Option (A) represents a one-time event rather than an ongoing program. A specialized prosthetics curriculum (C) is unrelated to foundational school programs. Donation drives (D) may support the program but do not define its essence. Hence, a coordinated set of preventive and educational measures is the hallmark of a School Oral Health Program.

82. (B) Twice-yearly screenings and referrals for necessary treatment

School oral health initiatives generally feature regular dental check-ups to detect caries, periodontal conditions, or other pathologies early. They often conduct these screenings once or twice a year, ensuring timely referrals to dental professionals for further management if needed. Advanced orthodontic corrections (A) and dentures (D) are not routinely part of such general programs unless specifically indicated. Educating teachers (C) is helpful, but restricting outreach to them alone defeats the purpose of improving children's oral health. Thus, (B) represents a typical and effective component of school-based oral care.

83. (C) Ignoring minor carious lesions until they become painful

A well-rounded school oral health strategy underscores early detection and intervention for dental issues, thereby preventing complications and promoting healthy habits. Supervised toothbrushing (A) instills practical skills. Offering healthier food options (B) curtails sugar consumption, mitigating caries risk. Involving parents (D) increases program success as home support bolsters in-school efforts. However, neglecting early signs of decay (C) runs counter to preventive principles, as small lesions can progress to significant problems if untreated. Therefore, (C) is the approach that deviates from proven preventive strategies.

84. (B) Schools provide a captive audience to instill lifelong healthy habits early

Schools serve as an ideal setting to nurture positive health behaviors among children who are in a structured environment daily. By integrating oral health education and preventive measures into routine school activities, professionals can shape practices that persist into adulthood. Early interventions also curb the onset and progression of dental diseases. Options (A) and (C) are unrelated to the broader goals of school oral health programs. Restricting efforts to high-income private institutions (D) would undermine the inclusive public health objective of ensuring equitable access for all children.

85. (B) A comprehensive program provides ongoing services and education, while a one-time camp offers temporary interventions

A single-day or periodic dental camp might reach a group of students with screenings or treatments briefly, but fails to embed sustained oral health practices or follow-up. In contrast, comprehensive school programs incorporate regular screenings, supervised brushing, dietary guidance, and educational sessions into the academic calendar. This continuity allows for earlier detection of dental issues, consistent reinforcement of healthy habits, and better outcomes in the long run. As a result, a holistic approach stands in contrast to limited-impact, short-duration dental camps.

86. (C) Promoting essential oral hygiene practices and conducting preventive measures

School oral health programs are designed to teach children effective brushing and flossing, the importance of a balanced diet, and the dangers of excessive sugar. Such programs often include fluoride mouth rinses or varnish applications and, where possible, pit-and-fissure sealants. By embedding prevention and education, students can form life-long healthy habits. Post-graduate dental education (A) is outside the scope of these initiatives. Option (B) is inappropriate and harmful.

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Sports activities (D) can benefit overall health but are not the central aim of a dental-focused program.

87. (A) Both A and R are true, and R is the correct explanation of A

While schools provide primary learning environments, consistent reinforcement at home ensures children maintain newly acquired oral hygiene habits. Parental guidance, monitoring of brushing routines, and control of sugary diets significantly enhance the program's effectiveness. Without caregiver support, children may revert to suboptimal habits, limiting progress made in school. Consequently, the assertion that parent involvement is critical (A) is accurate, and the reason (R) clarifies precisely why—home reinforcement and support remain integral for long-lasting outcomes. Hence, both are true, and R fully explains A.

88. (B) Partnering with governmental or NGO resources to include public schools

Collaboration with government bodies or non-governmental organizations often secures funding, materials, and expertise, allowing expansions into underprivileged areas. By implementing such partnerships, school-based programs can provide services regardless of socioeconomic barriers, ensuring that students lacking resources still benefit. Option (A) and (C) neglect public institutions and low-income families. High fees (D) also deter participation, leaving the most vulnerable populations underserved. Therefore, forging alliances with agencies that advocate equitable access is the optimal means of inclusive service delivery for all schoolchildren.

89. (B) Obtain parental consent and schedule preventive treatments

Pit-and-fissure sealants and fluoride varnishes are standard preventive measures for newly erupting permanent teeth and high-risk children. By securing parental permission, the school can coordinate these treatments within or outside school premises, benefiting students at an early stage. Ignoring the dentist's guidance (A) fails to address caries risk. Referral to a specialized oral surgeon (C) is typically unnecessary for routine preventive care. Demanding extractions (D) for early cavities contradicts the principle of conservative, minimally invasive management. Hence, scheduling the recommended preventive treatments is the logical next step.

90. (B) Conduct a baseline assessment of existing oral health status

Prior to implementing interventions, an accurate baseline assessment reveals the extent and nature of oral health problems, guiding program design. By systematically examining students and documenting caries prevalence, gingival health, and any urgent needs, the team can prioritize resources effectively. Offering dentures (A) or performing extensive restorative work (C) without initial data might misallocate efforts. Removing recess (D) to curb snacking is an extreme step that compromises children's overall well-being. Therefore, a thorough baseline assessment lays the foundation for a targeted, efficient, and ultimately sustainable school oral health program.

91. (B) A set of coordinated strategies and regulations designed to improve population-level oral health

Oral health policies guide governments and organizations in forming regulations, allocating resources, and implementing programs that address oral diseases and inequities at the population level. This scope involves prevention, treatment, workforce training, and research backing. Policy frameworks may involve water fluoridation, school-based programs, or subsidized dental services. Restricting policies only to private clinics (A) fails to address broader social determinants. Monthly procedures for everyone (C) are impractical. Requiring a licensing exam (D) may be one aspect of regulation but not representative of overall policy objectives.

92. (B) World Health Organization (WHO)

The World Health Organization (WHO) is a specialized agency of the United Nations responsible for international public health, including oral health. Through programs, guidelines, and technical assistance, WHO supports countries in developing effective policies and interventions to reduce oral diseases. The World Trade Organization (A) deals with trade regulations, while the International Monetary Fund (C) focuses on financial stability. The United Nations High Commissioner for Refugees (D) provides protection and assistance

to displaced populations, rather than specific oral health policy frameworks. Hence, WHO serves as the principal authority.

93. (D) Outlawing all forms of preventive dentistry to boost private business

National oral health policies generally focus on expanding access to preventive and treatment services, especially in underserved regions. Enhancing the workforce (A), fluoridating water supplies (B), and promoting health campaigns (C) are common policy elements. A measure that bans preventive dentistry (D) contradicts the very purpose of these policies, which aim to reduce oral disease burdens and promote public well-being. Thus, (D) stands out as an implausible or detrimental policy step, diametrically opposing standard public health objectives.

94. (B) Integrated policies ensure collaboration across sectors like nutrition, education, and healthcare for broader impact

Oral health is interlinked with overall well-being, influenced by factors such as diet, hygiene habits, and social determinants. International guidelines call for integrated policies that involve multiple sectors—like primary healthcare, schools, and community centers—to tackle these complexities holistically. Working in silos (C) often results in fragmented programs and missed opportunities for synergy. Rejecting the significance of oral health (D) is not reflective of current global priorities. Therefore, multi-sector collaboration enhances effectiveness, ensuring that preventive strategies and interventions reach the widest possible population.

95. (C) Strengthening community-based preventive strategies and providing equitable access

India's oral health framework focuses on preventive measures—like promoting community water fluoridation, school oral health programs, and accessible treatment facilities—to ensure equitable services across urban and rural regions. It aims to reduce disparities by supporting infrastructure development, workforce training, and health education. Restricting oral healthcare (A), prioritizing only curative approaches (B), or closing educational institutions (D) runs counter to public health objectives. Instead, the policy encourages broad-based preventive and curative interventions within a functional infrastructure that addresses oral health needs inclusively.

96. (C) Increased access to routine dental care and preventive services

Subsidized insurance generally lowers financial barriers, allowing more individuals to afford routine check-ups and preventive measures, such as cleanings or sealants. This promotes earlier diagnosis of caries and periodontal disease, thereby curbing advanced complications and related costs. Lower costs and greater coverage typically stimulate an uptick in service utilization, contradicting (A). With improved coverage, attention to early intervention (B) typically increases rather than diminishes. Out-of-pocket expenses (D) often decrease when third-party payment systems, such as government subsidies, help finance care. Hence, broader insurance coverage drives enhanced utilization of dental services.

97. (B) Providing a minimal set of affordable preventive and primary oral health services

The WHO's Basic Package of Oral Care (BPOC) is grounded in cost-effective interventions that can be integrated into primary healthcare settings. These typically include emergency oral care, affordable fluoride toothpaste, and atraumatic restorative treatment (ART) for simple restorations. By emphasizing prevention and basic treatment, BPOC addresses essential oral health needs, especially in resource-limited communities. High-end cosmetic treatments (A) and universal implants (C) are neither economically feasible nor central to public health objectives. Outreach programs (D) are integral to BPOC, involving education and collaboration at the community level.

98. (A) National policies often set broad frameworks and funding, while municipal initiatives adapt them to local needs

National-level directives establish overarching objectives, strategies, and resource allocations to guide oral health improvements. Municipal or local bodies interpret and implement these strategies based on specific demographics, cultural factors, and resource availability. By adapting national policies, local authorities can design effective

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programs that address unique challenges faced by their communities. Suggesting both are irrelevant (B) overlooks their complementary nature, while (C) incorrectly assumes local plans override national laws. As (D) states, they are indeed distinct, with national policies providing direction and local initiatives executing tailored interventions.

99. (C) Training and deploying mid-level dental providers for preventive and basic treatment services

In developing nations with limited resources, mid-level dental providers (e.g., dental hygienists, therapists) can extend preventive care, basic restorations, and education to underserved regions far more cost-effectively than specialized urban clinics. By addressing fundamental treatment needs—like simple fillings and prophylaxis—these providers reduce disease burden and the necessity for advanced interventions. Mandatory private insurance (A) or funding high-end city clinics (B) may exclude rural populations. Similarly, prioritizing cosmetic procedures (D) overlooks the pressing need for accessible basic care. Thus, strengthening mid-level capacity is often the most pragmatic initial approach.

100. (A) 1, 2, and 3 only

Atraumatic restorative treatment (ART) (1) empowers frontline health workers to manage simple caries without complex equipment, boosting care accessibility. Subsidizing fluoride toothpaste (2) encourages preventive behavior, vital for low-income populations. Collaborating with schools (3) fosters early interventions, crucial for long-term oral health improvements. Funding specialized cosmetic surgeries (4) is less aligned with the immediate goal of broad public health coverage and reducing disparities among rural adults who urgently need basic preventive and restorative services. Therefore, measures 1, 2, and 3 collectively promote equitable and impactful oral health outcomes.

101. (B) Factors like income, education, and access to care that influence oral health outcomes

Social determinants of oral health refer to the socioeconomic and environmental circumstances that affect an individual's risk for oral diseases. This includes factors such as household income, educational level, availability of fluoridated water, and proximity to dental services. These determinants shape dietary patterns, oral hygiene practices, and the likelihood of seeking professional care. Option (A) addresses a clinical restoration procedure rather than broader societal elements. Genetic predisposition (C) is only one component and does not capture broader societal influences. Meanwhile, (D) focuses on enamel research, missing the broader social perspective.

102. (B) Late 19th century

Although efforts at sanitation and disease prevention have existed for centuries, Public Health became a systematic, recognized field largely in the late 1800s. This period witnessed governmental interventions in vaccination, control of infectious diseases, and improvements in urban sanitation. Cities grew rapidly during the Industrial Revolution, forcing authorities to address overcrowding, water supply, and outbreaks like cholera. Formal public health acts and associations began to coalesce around this time. Earlier eras, such as the medieval period (A) and Renaissance (C), lacked the structure of modern public health, while the 21st century (D) builds on well-established frameworks.

103. (C) Health promotion and disease prevention on a community scale

Dental Public Health aims to reduce oral disease and promote well-being in populations rather than concentrating on single-patient treatments. It involves coordinating public initiatives such as fluoridation, school oral health programs, and access to routine care. Clinical dentistry addresses individual diagnoses, restorative services, and specialized interventions. By contrast, community-based dentistry looks at social determinants, cost-effectiveness, and collective strategies to prevent oral disease. Focusing solely on cosmetic services (D) or advanced clinical work (B) does not encompass the preventive and population-oriented essence that distinguishes Dental Public Health from private, individual-focused practice.

104. (C) Collaboration

Public Health traditionally rests on three core functions: Assessment, Policy Development, and Assurance. Assessment entails systematic data

collection about the population's health status. Policy Development uses these findings to create strategies, guidelines, or regulations. Assurance involves ensuring necessary health services are available and high-quality. Although collaboration is integral to effective public health practice, it is typically viewed as a supporting principle rather than a formally designated "core function." Collaboration enhances each of the three recognized core pillars but is not listed as one of the fundamental functions defined in public health doctrine.

105. (C) Community Dentistry emphasizes direct outreach and local-level interventions, while Public Health Dentistry can influence larger-scale policy

Although closely related, Community Dentistry typically refers to hands-on initiatives at municipal or grassroots levels—like local screenings, schools-based programs, or community clinics. Public Health Dentistry broadens the lens to include regional or national policy-making, data analysis, and large-scale preventive measures (e.g., water fluoridation or legislation against tobacco use). In practice, they often overlap, but "Public Health Dentistry" can be more aligned with policy formulation, research, and broader scope planning. They share epidemiological methods (thus negating D). Similarly, they are not simply alternate labels for the same discipline, though confusion sometimes arises (negating A).

106. (D) Preventing the disease from occurring in the first place

Primary Prevention prevents diseases or conditions before they begin. In dentistry, this might include water fluoridation, dental sealants, and oral health education to avert caries, periodontal issues, or other oral maladies. Contrarily, early detection and management (A) denotes Secondary Prevention, while rehabilitation for severe tooth loss (B) is Tertiary Prevention. Completely banning sugar (C) is an extreme measure unrelated to the typical definition of primary prevention, which generally focuses on feasible interventions that reduce risk factors without wholly eliminating them from daily life. Hence, (D) reflects the fundamental goal of preventing disease onset.

107. (B) Application of xylitol-containing products

Xylitol, a natural sugar substitute, has antimicrobial effects against mutans streptococci, reducing their ability to adhere to tooth surfaces. Regular use of xylitol-containing gums or lozenges can lower bacterial levels and diminish the risk of caries. Pit-and-fissure sealants (A) protect occlusal surfaces but do not specifically target mutans streptococci's metabolic processes. High-sugar lunches (C) would encourage bacterial acid production. While smoking cessation (D) is beneficial for overall oral and systemic health, it is not directly aimed at curbing mutans streptococci. Thus, xylitol stands out for its unique antibacterial properties.

108. (C) They block bacterial colonization in vulnerable pits and fissures

Pit-and-fissure sealants create a protective barrier, especially on occlusal surfaces of molars, preventing plaque accumulation and subsequent acid attack. By sealing off these anatomically prone grooves, sealants reduce the likelihood of carious lesions developing in hard-to-clean spots. They do not cure active decay (A), nor do they involve grafting (B). Aesthetics (D) is not their primary function—though some materials can be tooth-colored, the core objective is mechanical protection against caries. Consequently, fissure sealants exemplify a key primary prevention strategy by stopping bacterial infiltration before lesions form in high-risk areas.

109. (D) Placement of immediate dentures after tooth extraction

Secondary prevention focuses on intercepting disease at an early stage to halt or reverse its progression. Regular screenings for incipient lesions (A) and timely scaling/polishing (B) address early forms of disease. Fluoride mouth rinses (C) can aid in remineralizing early enamel changes, preventing full-blown caries. However, providing immediate dentures (D) is more aligned with tertiary prevention, where a patient's oral condition is advanced enough to require rehabilitative measures. Tertiary prevention aims to restore function after significant damage. Thus, immediate dentures are rehabilitative, making them the exception in a list of secondary preventive interventions.

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110. (C) Tertiary prevention aims to rehabilitate function after significant disease progression, while primary prevention prevents disease onset

Prevention in dentistry comprises distinct stages. Primary prevention endeavors to stop disease from arising through measures such as sealants, fluoridation, and oral hygiene education. Tertiary prevention, on the other hand, addresses extensive damage—like severe caries or advanced periodontitis—by restoring function (e.g., crowns, dentures, implants) and preventing further breakdown. Secondary prevention intervenes when disease is early or moderate, minimizing escalation. Banning sugary diets (B) is more an environmental measure, not necessarily tertiary care. Both prevention levels serve different objectives: halting disease before it begins (primary) versus rehabilitating advanced conditions (tertiary).

111. (D) Stained permanent teeth with no caries

The DMFT index comprises three categories for permanent teeth: Decayed (D), Missing because of caries (M), and Filled (F). These components capture both untreated and treated lesions to reflect a person's or population's caries history. Teeth that are merely stained but not decayed, missing, or filled are not accounted for in this measure, as stains alone do not necessarily indicate carious pathology. Only when a tooth shows active decay, has been lost due to decay, or is filled is it included in the DMFT scoring, making (D) an exclusion.

112. (A) Decayed, extracted (due to caries), and filled primary teeth

The def index applies specifically to primary (deciduous) dentition, quantifying teeth that are decayed, extracted (because of caries), or filled. This pediatric counterpart to the DMFT index highlights a child's caries burden and the level of treatment provided. Distinctions like "eroded" or "discolored" surfaces, or referencing permanent dentition, do not align with def. Similarly, diastema or fluoride habits are not part of the def scoring system. By focusing on primary teeth, the def index helps identify risk at an early age, promoting timely interventions to prevent further decay progression.

113. (B) They allow for standardized comparisons of caries experience across different populations

Indices such as DMFT supply a quantifiable measure of caries experience, encompassing untreated decay, missing teeth due to decay, and fillings. They enable policymakers, researchers, and clinicians to compare levels of oral disease in varying demographics and track trends over time. This comparison can guide the allocation of resources or the evaluation of interventions like fluoridation. Option (A) addresses individual satisfaction, which is outside the scope of DMFT. Severe gum diseases typically require periodontal indices (C). Indices do not replace a thorough clinical exam (D); rather, they summarize key findings for epidemiological purposes.

114. (D) Dean's Fluorosis Index

Periodontal indices measure aspects of periodontal health, including gingival inflammation, pocket depth, calculus, or bleeding on probing. CPITN was an older nomenclature updated to CPI, both focusing on population-level periodontal needs. The Gingival Index by Löe and Silness quantifies inflammation severity in the gingival tissues. Dean's Fluorosis Index, however, classifies the severity of dental fluorosis affecting enamel. Though crucial in epidemiology, it does not address periodontal status, making it the exception among the listed indices. Hence, while (A), (B), and (C) evaluate gum and periodontal health, (D) is unrelated to periodontal assessment.

115. (A) Plaque Index measures plaque thickness at the gingival margin, while OHI-S scores both plaque and calculus on selected tooth surfaces

Silness and Löe's Plaque Index grades the thickness of plaque specifically at the gingival margin, emphasizing the connection between plaque, gingival inflammation, and periodontal health. Meanwhile, the Simplified Oral Hygiene Index (OHI-S) by Greene and Vermillion rates both plaque (debris) and calculus on assigned surfaces of index teeth to provide an overall measure of cleanliness. OHI-S thus captures two variables, whereas the Plaque Index focuses more narrowly on plaque around the gingival area. They are not identical, nor do they simply measure stains or decay, so (A) accurately differentiates these two widely used indices.

116. (B) Longitudinal study

A longitudinal design observes the same group of participants over a specified period, allowing for the assessment of changes (like caries progression) and the factors influencing them. Annual follow-ups help identify how interventions or behavioral shifts affect disease rates. Cross-sectional (A) takes a one-time snapshot; ecological (C) deals with population-level data without tracking individuals. Case-control (D) retrospectively compares individuals with and without a condition, rather than regularly monitoring a consistent cohort. Thus, a longitudinal approach is best suited for charting annual changes in caries prevalence within a defined group.

117. (C) Selecting subjects based on current disease status and comparing their past exposures

In a case-control design, researchers begin by identifying "cases" who have a specific disease—such as severe caries or oral cancer—and "controls" who do not have it. They then look retrospectively at differences in prior exposures or risk factors (e.g., diet, tobacco use). This approach contrasts with cohort studies (A), which follow healthy subjects forward in time. Random allocation to treatment (B) describes a randomized controlled trial, and investigating population data without individual-level details is more characteristic of an ecological study (D). Therefore, (C) encapsulates the hallmark of case-control methodology.

118. (A) Both A and R are true, and R is the correct explanation of A

RCTs are viewed as the pinnacle of clinical research because randomization minimizes selection bias—ensuring neither researchers nor participants systematically influence group allocation. This design fosters equivalent groups regarding baseline characteristics, making any subsequent differences in outcomes more attributable to the intervention itself. Thus, (A) is accurate. The reason (R)—that random assignment reduces bias—is the core principle explaining why RCTs hold top evidence status. If participants were allocated non-randomly, confounding factors could distort results. Therefore, both statements are true, with the reason correctly supporting the assertion of RCT superiority.

119. (D) Conducting only unstructured interviews without standardized measures

An effective oral health survey relies on scientific rigor. Selecting valid indices (A) ensures consistent data collection; calibrating examiners (B) reduces inter-observer variability; and using a representative sample (C) allows generalizable results. Relying exclusively on unstructured interviews with no standardized or quantitative measures (D) would undermine reliability and validity, making data difficult to compare or interpret. While qualitative insights can be helpful, surveys typically incorporate standardized indices and well-defined methods to produce robust epidemiological findings. Thus, (D) is the only approach listed that does not fit a proper survey framework.

120. (A) Cross-sectional collects data at a single point, while longitudinal follows subjects over time

Cross-sectional surveys capture a "snapshot" of health status, risk factors, or behaviors in a population at one point in time. By contrast, longitudinal surveys repeatedly observe the same individuals, tracking changes and enabling insight into disease progression or intervention impact. They are not identical (B), and both can involve clinical exams or self-reported questionnaires—thus negating (C). Cross-sectional surveys remain widely used in oral health research for evaluating prevalence and risk associations, so (D) is incorrect. The fundamental distinction is the single time-based approach versus continuous or repeated follow-up.

121. (B) A comprehensive plan integrating dental check-ups, preventive services, and oral health education within the school setting

A School Oral Health Program typically aims to ensure early detection of dental problems, provide preventive services like fluoride mouth rinse or sealants, and instill positive oral hygiene habits among students. Regular check-ups help identify caries or gum issues early. Education modules and supervised brushing build lifelong behaviors. Single-day events (A) may help temporarily but lack sustained impact. Marketing private clinics (C) contradicts the community-oriented spirit of such programs, and imposing universal root canals (D) is extreme and medically unwarranted. Thus, the hallmark is a coordinated, ongoing approach to oral health within schools.

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122. (A) Fluoride varnish applications at scheduled intervals

Programs aiming to reduce caries in children frequently employ fluoride varnishes, as this topical measure strengthens enamel and helps reverse early lesions. Proper scheduling—often every six months—maximizes preventive benefits. By contrast, (B) suggests unnecessary removal of wisdom teeth in children, which is neither standard practice nor typically relevant in younger students. Marketing sugary beverages (C) undermines preventive goals by promoting cariogenic diets. Cosmetic bleaching (D) is an elective procedure not aligned with the fundamental objectives of a public health–oriented program. Therefore, scheduled fluoride varnish is a recognized, evidence-based intervention.

123. (B) Teachers ensure the knowledge and practices taught reach children consistently in daily routines

Teachers interact with students daily, making them key allies in reinforcing oral health messages through regular reminders, supervised brushing sessions, and classroom activities. Their ongoing presence allows them to observe changes in a child's oral hygiene habits and encourage proper technique. While they cannot substitute qualified dental professionals for clinical services or surgeries (A) or (D), teachers become vital partners in ensuring continuity of preventative measures beyond occasional dental visits. Supervising post-graduate research (C) is outside the typical responsibilities of most schoolteachers. Thus, their main contribution is embedding health lessons into everyday learning routines.

124. (C) Only providing advanced prosthetic treatments to a few students

Sustainability in school-based oral health interventions depends on widespread participation, consistent education, parental involvement, and routine assessments to refine strategies. Engaging students with interactive, age-appropriate sessions (A) and informing parents (B) fosters reinforcement at home. Periodic evaluations (D) ensure that the initiative's effectiveness is measured and improved over time. Limiting services to advanced prosthetic treatments for a select minority (C) overlooks broader preventive priorities and fails to address the majority's needs. Prosthetic care might occasionally be necessary, but a sustainable program highlights prevention, broad coverage, and long-term impact for all students.

125. (B) A comprehensive program involves ongoing education, prevention, and follow-up care; outreach camps are typically brief, with limited follow-up

Short-term dental outreach camps can provide immediate relief—like screening or basic treatment—often in underserved areas. However, they rarely embed sustained preventive practices or rigorous follow-up. A comprehensive school-based initiative weaves oral health education, supervised hygiene drills, and periodic preventive measures (e.g., sealants or fluoride) into the academic calendar. Teachers, parents, and local health authorities typically coordinate to monitor progress and maintain continuity. Hence, (B) captures the critical difference. Not all camps rely on mobile vans, so (A) is too narrow. Outreach camps generally do not supervise brushing daily (C), and teacher involvement (D) is encouraged in comprehensive programs.

126. (B) WHO

The World Health Organization (WHO) introduced the goal of "Health for All by the Year 2000" in the late 1970s, aiming to extend essential healthcare to every global citizen. This vision guided many nations in formulating public health strategies, including oral health measures like wider access to preventive services and community-based initiatives. UNESCO (A) addresses education and cultural matters, while FAO (C) focuses on food and agriculture. UNICEF (D) centers on children's health and welfare but does not specifically coordinate overall health policies for all populations. Hence, WHO is the correct answer.

127. (C) To improve population-level oral health through organized strategies, resources, and regulations

National oral health policies aim at reducing disease prevalence, promoting preventive services, and ensuring equitable care across diverse populations. Policymakers often address workforce distribution, infrastructure, financing, and public education, thereby enabling greater access to essential services. Privatizing all dental services (A) can undermine universal reach; mandating tooth extractions (B) is

neither feasible nor aligned with preventive goals. Restricting care to certain regions (D) ignores health equity. Instead, the goal is to enhance oral health outcomes for all citizens through systematic resource allocation, supportive legislation, and integrated public health measures.

128. (B) Collaboration ensures a multi-faceted approach to address underlying causes and improve overall health outcomes

Oral health can be influenced by diet (involving agriculture), school-based interventions (involving education), and economic accessibility (involving finance). Working together, these sectors can create environments that foster low-sugar diets, improved community education, and affordable care. For instance, agricultural policies could limit sugar content in national food supplies, while education ministries can incorporate oral health curricula. Financing mechanisms can subsidize essential dental care for vulnerable populations. Handling each issue in isolation (D) fails to address the complexities behind oral diseases. Hence, synergy across multiple fields is key to successful prevention and health promotion (negating A and C).

129. (C) Encouraging sugary foods in school canteens

WHO emphasizes preventive strategies that address modifiable risk factors for oral disease, including restricted sugar intake, fluoride use, and avoidance of harmful behaviors like tobacco consumption. Training primary care workers in basic oral assessments (D) aids in early detection and referral. Likewise, water fluoridation (A) is often recommended to lower caries incidence at the community level. Encouraging high-sugar snacks (C) contradicts guidelines, as excessive sugar remains a principal driver of caries. Hence, such measures run counter to WHO directives promoting dietary changes for improved oral health, making (C) the clear exception.

130. (B) Developing countries often prioritize primary care access, while industrialized nations may emphasize advanced technologies and specialized treatments

In many developing countries, limited resources and large underserved populations drive governments to focus on basic infrastructure and primary oral healthcare to reduce caries and periodontal disease. Strategies often include training mid-level dental providers, water fluoridation (where practical), and school-based prevention. Wealthier, industrialized nations generally have well-established basic dental services and, therefore, can expand on advanced restorative technology, implants, and specialized care. This does not mean advanced care is absent in developing regions, but the policy emphasis tends to differ due to economic constraints, population density, and priority health needs (negating A, C, and D).

131. (C) Strengthening anti-tobacco legislation and incorporating oral screening in primary healthcare

When high oral cancer incidence is linked to tobacco use (particularly smokeless forms), strong policies that curb tobacco availability, regulate marketing, and increase taxes can reduce consumption. Incorporating routine oral screenings into primary care facilitates earlier detection of potentially malignant lesions. While fluoride mouthwash (A) prevents dental caries, it does not tackle the root cause of tobacco-related malignancies. Porcelain veneers (B) and bleaching (D) are cosmetic treatments that fail to address carcinoma risk. Hence, controlling tobacco products and ensuring timely screenings remain the most relevant and cost-effective measures for diminishing oral cancer rates.

132. (A) Lower purchase and consumption of sugar-rich beverages

Raising taxes on sugary beverages typically drives up retail prices, discouraging consumers—particularly price-sensitive groups—from purchasing these products. Reduced sugar intake lowers acid production by cariogenic bacteria in the mouth, thereby decreasing the incidence of dental caries. While policy changes can have unintended consequences, there is little evidence to suggest a direct jump to tobacco use (B) as a replacement. Universal extraction (C) or no change in habits (D) do not logically follow an effective taxation strategy. Thus, (A) aligns with the broader public health goal of reducing sugar-driven dental decay.

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133. (C) Emphasizing essential preventive and minimal invasive treatment approaches

WHO's basic package of oral care seeks to ensure cost-effective, broadly accessible solutions, especially in underserved areas. This strategy highlights prevention—like fluoride use—and simple restorative treatments, such as atraumatic restorative treatment (ART), where high-end equipment may not be available. Option (A) contradicts the principle of affordability. Eliminating free primary care (B) would worsen disparities, while an across-the-board cosmetic focus (D) is not a priority in low-resource environments. By promoting minimal invasive measures, WHO encourages efficient allocation of limited resources to address core oral health needs first, thereby boosting equity in healthcare delivery.

134. (C) A is true, but R is false

Oral health is intricately linked to systemic conditions, including diabetes, cardiovascular diseases, and nutritional status. Integrating dental screening, counseling, and preventive measures into primary healthcare settings ensures early identification of oral issues alongside other risk factors. This holistic approach helps reduce fragmented care and improves health outcomes overall, making the Assertion valid. However, the Reason is incorrect, as oral health is not isolated; rather, it has well-documented connections with the rest of the body. Collaboration between dental professionals and general health providers is essential for comprehensive prevention and management strategies.

135. (C) Formulating strategies without evaluating available resources

An evidence-based policy process typically involves collecting up-to-date data (A), ensuring collaboration among various stakeholders (B), and testing pilot initiatives (D) to refine programs prior to large-scale implementation. Neglecting the resource evaluation phase (C) is a serious oversight—policymakers must consider budget constraints, workforce availability, and infrastructural capacity when crafting feasible strategies. Inadequate resource alignment often leads to poorly executed or unsustainable interventions. Hence, any robust health policy design includes a thorough assessment of financial, human, and logistical resources alongside epidemiological insights to ensure realistic, effective, and enduring outcomes.

136. (B) Routine training of local health workers in basic periodontal screening, hygiene instruction, and referral pathways

Severe periodontitis in a remote area underscores the importance of early detection and consistent preventive measures. By equipping local health workers with the skills to identify gum disease, instruct proper hygiene, and connect patients to referral networks, communities can reduce progression and tooth loss. Advanced or one-time specialized procedures (A) may not be sustainable without continued maintenance or follow-ups. Cosmetic treatments (C) do not address periodontal pathology, while pulpectomy (D) manages endodontic concerns rather than periodontal needs. Hence, training frontline workers yields a broader, long-lasting impact in such underserved regions.

137. (B) Primary

Pit-and-fissure sealants and fluoride application for incipient lesions predominantly aim to prevent progression of early disease or the onset of new decay. They act before substantial structural damage demands restorative or rehabilitative procedures. While one might argue that treating incipient lesions falls into secondary prevention, the standard categorization deems protective sealants and topical fluoride to be primary—especially if the decay is minimal or the tooth surface is intact. Secondary prevention often includes early detection and simple restorations, while tertiary deals with more advanced damage. Quaternary prevention addresses avoiding over-treatment, which is not relevant here.

138. (B) Periodic free check-up camps plus basic restorative services in community clinics

Expanding accessible care by offering periodic check-ups and essential restorative treatment within local clinics can significantly diminish untreated decay and missing teeth. This model bridges financial and geographic barriers, encouraging earlier interventions. Free implants (A) and crowns (D) are highly specialized, costly measures that fail to address the bulk of needs across a low-income population. Additionally, bleaching (C) is cosmetic, providing no relief from extensive decay

or missing posterior teeth. Thus, a preventive and basic treatment approach, integrated into regular community-based services, effectively tackles the widespread oral health challenges in disadvantaged urban areas.

139. (C) Educate patients on preventive measures, nutritional guidance, and the importance of regular check-ups

Integrating public health in a private setting starts with robust patient education, which fosters prevention and early intervention. By guiding individuals on home care, dietary habits, and scheduling periodic exams, dentists can reduce the overall disease burden. High-end cosmetics (A) should not overshadow fundamental preventive dentistry, and dismissing financially struggling patients (B) runs counter to public health ideals. Free implants for everyone (D) is financially unsustainable and unnecessary for most patients. Consequently, effective patient education stands out as an achievable, impactful method to incorporate a population-focused perspective into private practice.

140. (A) Lower tobacco consumption reduces exposure to carcinogens, thereby reducing oral cancer risks

Economic policies that elevate tobacco prices often decrease consumption, especially among cost-sensitive populations. With fewer individuals using tobacco products, carcinogenic exposure in the oral cavity lessens, helping reduce the incidence of oral and oropharyngeal cancers. While some unintended consequences can arise, there is no evidence of mass sugar overuse (B) or bleaching product substitution (D) as a direct effect of tobacco tax hikes. Moreover, (C) contradicts multiple public health studies demonstrating that increasing costs can meaningfully diminish tobacco use. Hence, the direct link is lower consumption leading to reduced cancer risk.

141. (C) A is true, but R is false

Water fluoridation stands as an effective, broad-reaching strategy proven to decrease caries rates in communities, making it a fundamental public health intervention. Since fluoridation is typically municipally regulated, individuals do not pay separately for it, which helps address inequalities. The reason statement, claiming it only benefits those who can afford fluoridated toothpaste, is incorrect because water fluoridation actually improves access for everyone using the public water supply. Those who may not purchase fluoridated products can still receive fluoride protection through drinking water. Therefore, the assertion is valid, whereas the reason is flawed.

142. (D) Expecting one rinse session to last for multiple academic years without repetition

Fluoride mouth rinse programs must be repeated regularly (often weekly or monthly) to effectively protect teeth against caries. Obtaining parental consent (A) is essential from an ethical and legal standpoint, and giving instructions in a language children understand (B) aids compliance. Proper record-keeping (C) helps track adherence and outcomes. However, it is unrealistic to believe that a single fluoride rinse session could confer benefits throughout multiple academic years. Fluoride's protective effect relies on periodic exposure, making repeated applications a cornerstone of such preventive initiatives. Thus, (D) represents the incorrect assumption.

143. (C) Organizing supervised brushing classes in schools

High plaque scores often reflect inadequate or incorrect brushing techniques. Providing structured, hands-on instruction in schools allows teens to practice effective cleaning under guidance, fostering lasting habits that reduce plaque. While fluoride varnishes help remineralize enamel and prevent caries, they do not directly address plaque removal if oral hygiene is poor (A). Distributing sweetened drinks (B) obviously increases plaque risk. Root planing (D) is a clinical procedure indicated for advanced periodontal disease, not a universal measure for every teen. Thus, supervised brushing sessions are the most appropriate initial public health response.

144. (C) Local or municipal authorities

In many regions, local or municipal agencies oversee water treatment facilities, including decisions about adjusting fluoride concentrations. While national guidelines may exist, fluoridation logistics (such as dosage and monitoring) often

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fall under local jurisdiction. Federal governments (A) can recommend or fund water fluoridation, yet the hands-on execution usually rests with smaller entities. Dental corporations (B) focus on clinical services, and pharmaceutical companies (D) produce drugs and related products rather than operating water systems. Consequently, municipalities are best positioned to implement and maintain optimal fluoridation levels, ensuring safe, standardized delivery to the public.

145. (B) To preserve as much healthy tooth structure as possible and reduce healthcare costs

Minimal intervention dentistry (MID) adheres to a philosophy of detecting early carious changes and intervening conservatively (e.g., using sealants, glass ionomer, or remineralization strategies) to prevent extensive damage. By preserving healthy tooth tissue, MID helps reduce the likelihood of complex, expensive procedures in the future. This approach fits well within public health frameworks, as it fosters sustainability, accessibility, and cost-effectiveness. Pursuing maximal profit via aggressive treatments (A) contradicts preventive aims, while focusing solely on aesthetics (C) neglects broader disease control. Option (D) invites progression to advanced pathology, escalating overall cost and morbidity.

146. (B) Oral hygiene counseling, scaling, and topical fluoride application

Pregnancy can predispose women to gingival inflammation due to hormonal fluctuations, highlighting the need for thorough plaque control and regular check-ups. By providing oral hygiene instruction, scaling off plaque and calculus, and applying fluoride to arrest early lesions, the dentist aligns with preventive dentistry principles. This approach safeguards maternal oral health and potentially reduces the transmission of cariogenic bacteria to the infant. Meanwhile, extracting all questionable teeth (A) is unnecessarily drastic, and advanced implant referral (C) isn't indicated at this stage. Avoiding care until postpartum (D) risks progression of gingivitis and caries.

147. (B) Educate on glycemic control, provide scaling/root planing, and arrange short-interval follow-ups

Proper management of advanced periodontal disease in a patient with poorly controlled diabetes calls for a comprehensive approach addressing both systemic and local factors. Educating the patient on the interplay between diabetes control and periodontal inflammation encourages better glycemic management. Scaling and root planing reduce the bacterial load, controlling active periodontal infection. Frequent follow-ups help monitor both oral and systemic changes, allowing adjustments to care. Delaying all treatment (A) can allow further deterioration, and immediate implants (C) may fail if periodontal disease persists and blood sugar remains uncontrolled. Merely providing analgesics (D) neglects underlying issues entirely.

148. (B) Training local dental auxiliaries in atraumatic restorative treatment and basic removable prosthesis fabrication

High edentulism indicates a history of advanced dental disease, often tied to limited care access and financial constraints. By training mid-level providers or auxiliaries to deliver simple restorations and fabricate basic dentures, rural communities can gain more immediate, affordable solutions. This helps restore function and alleviates difficulties with chewing or speaking. Centralized implant centers (A) remain cost-prohibitive and geographically distant for many. Cosmetic bleaching (C) fails to address functional issues of edentulism, and mouthwashes alone (D) do little to restore missing teeth. Thus, empowering local personnel fosters broad, equitable improvement in oral health outcomes.

149. (C) Conducting a baseline national oral health survey to identify priority needs

A thorough baseline survey clarifies the prevalence and severity of key oral diseases, highlights which populations are most at risk, and determines resource gaps. This information then shapes policies, from prevention measures (e.g., water fluoridation) to service delivery strategies (e.g., training mid-level providers). WHO guidelines (A) provide globally recognized standards that can be adapted locally. Anecdotal data (B) cannot reliably direct nationwide policy, and restricting care (D) undermines equity objectives. Therefore, systematically collecting and analyzing population-specific information is critical

to crafting effective, evidence-based solutions for nationwide oral health challenges.

150. (B) Implementing water fluoridation where feasible, school-based sealant programs, and nutritional counseling

When large numbers of children show high caries incidence in resource-limited districts, population-wide prevention is paramount. Water fluoridation remains one of the most cost-effective measures, provided the infrastructure can adjust fluoride levels appropriately. School-based sealant initiatives protect children's teeth from pit-and-fissure decay, especially those prone to caries. Nutritional counseling, vital in tackling overreliance on sugary diets, educates families on healthier choices. Erecting a single advanced clinic (A) does not address widespread lack of preventive care. Monthly extractions (C) and adult rehabilitation (D) neither solve the root causes nor protect the district's children from ongoing disease burdens.

151. (B) Efforts to improve community health through organized initiatives and policy measures

Public Health encompasses collective actions and policies designed to enhance the health of entire populations, as opposed to focusing solely on individual-level treatments. It involves research, education, disease surveillance, and interventions (e.g., vaccination programs) that mitigate community-wide threats. Choice (A) confines care to private entities, which fails to capture the broad social mandate. Cosmetic procedures for a small group (C) offer limited preventative impact. Placing full financial burden on individuals (D) neglects systemic inequalities. Hence, (B) most accurately represents Public Health's overarching aim: a coordinated approach to protect and promote population health.

152. (B) Alma-Ata Declaration

Adopted in 1978, the Alma-Ata Declaration emphasized "Health for All," urging nations to develop primary healthcare infrastructures addressing preventive, promotive, and curative services at the grassroots level. It recognized the significance of community participation, inter-sectoral coordination, and accessible healthcare as fundamental to improving population well-being. Although not solely about dentistry, it underpins modern public health approaches, including oral health measures in primary care settings. The Magna Carta (A) predates modern healthcare concepts, and the Kyoto Protocol (C) deals with climate change. The Universal Declaration of Human Rights (D) addresses broad human rights, not specific health policies.

153. (C) Implementing population-based strategies to prevent and control oral diseases

Dental Public Health operates at the community or national level to reduce oral disease prevalence and promote optimal oral hygiene habits. It deploys measures like water fluoridation, school screenings, and risk-factor education to mitigate common conditions such as caries and periodontal disorders. Fostering community-wide improvements (C) ensures that preventive efforts benefit everyone, including underserved groups. By contrast, focusing solely on profit (A) or cosmetic work (D) overlooks the public service dimension central to Dental Public Health. Lobbying against proven preventive efforts like water fluoridation (B) runs contrary to its mission of broad-based oral disease prevention.

154. (D) Restricting health interventions to a wealthy minority

Public Health endeavors to protect and improve the health of communities through equitable strategies that minimize disparities. Key objectives involve promoting preventive services and ensuring resources reach all segments of society, including vulnerable populations. Thus, aiming to address health inequalities (B), promote disease prevention (C), and raise overall population well-being (A) reflect the ethos of Public Health. Restricting interventions to privileged groups (D) contradicts these principles. Effective Public Health frameworks focus on universal access, targeting individuals who might otherwise go untreated, thereby upholding fairness and inclusivity in healthcare provision and disease prevention.

155. (A) Public Health focuses on communal disease prevention, while Clinical Practice targets individual patient treatment

In dentistry, Clinical Practice centers on diagnosing and managing diseases for individual patients,

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delivering interventions like restorations, extractions, or periodontal therapy. Conversely, Public Health Dentistry extends its scope to entire communities, emphasizing mass prevention efforts like fluoridation and educational programs. Option (B) is false because Public Health prioritizes prevention rather than solely advanced care. Clinical Practice definitely involves patient-specific treatments (C), while Public Health is, by definition, saturated with preventive measures (D). Hence, (A) provides the correct distinction: population-level strategies versus individualized diagnosis and therapy within a clinic-based setting.

156. (B) Diet counseling and pit-and-fissure sealants

Primary prevention focuses on halting disease before significant damage occurs. Pit-and-fissure sealants effectively block bacterial colonization in vulnerable occlusal grooves, and diet counseling promotes reduced sugar intake, lowering caries risk. Full coverage crowns (A) are excessive for early enamel changes, removing healthy tooth structure unnecessarily. Extraction (C) is overly aggressive for mild lesions that can be managed noninvasively. Bleaching agents (D) address cosmetic staining but do little to prevent caries progression. Combining dietary guidance with sealants embodies the essence of primary prevention, preserving healthy tooth structure and preventing lesion escalation.

157. (A) Primary Prevention

Supervising toothbrushing among young children aims to curb plaque buildup and improve fluoride contact with enamel before caries arise, thus preventing disease at its earliest stage. Such guidance reduces the risk of misbrushing or ingesting excess toothpaste, optimizing the protective benefits of fluoride. Secondary Prevention (B) involves detecting and treating incipient lesions. Tertiary Prevention (C) addresses rehabilitation after significant damage, and Quaternary Prevention (D) typically guards against excessive or unnecessary medical interventions. Encouraging guided brushing is a classic primary prevention measure, limiting the initial onset of tooth decay by establishing sound oral hygiene habits early.

158. (C) A is true, but R is false

Fluoride mouth rinse initiatives in schools often significantly lower caries incidence by routinely exposing teeth to fluoride, enhancing remineralization, and inhibiting bacterial acid production. Therefore, the assertion (A) stands correct. However, the reason (R) is false because these programs do not teach advanced periodontal surgeries. Such surgeries are specialized procedures performed by trained dental professionals to address severe periodontal disease. School-based rinse programs focus on preventive measures, hygiene education, and occasionally basic screening—rather than complex periodontal interventions. Hence, while the mouth rinse strategy is an effective caries prevention tool, the provided reason misconstrues its scope and content.

159. (D) Issuing guidelines for repeated tooth extractions among caries-free children

Primary prevention aims to stop disease before it begins, employing interventions such as fluoride distribution (A), dietary counseling (B), and empowering local personnel (C) to educate communities. Unnecessary extraction in children with no caries (D) contradicts the preventive approach and can harm normal dental development, hamper speech, and adversely affect quality of life. The correct emphasis should be on safe, conservative measures—fluoride access, nutritional guidance, and improved home care—to avert future decay. Hence, (D) stands as an inappropriate policy that fails to align with the foundational goals of primary caries prevention.

160. (C) Reduced plaque accumulation and fewer carious lesions

Good oral hygiene practices—brushing at least twice daily and regular flossing—limit bacterial buildup on teeth and gingival margins. Consequently, acid production from cariogenic bacteria decreases, diminishing the likelihood of enamel demineralization and periodontal inflammation. Over time, systematic plaque control translates into lower incidence of cavities, particularly in populations adopting these habits early. The remaining options are counterintuitive: implementing proper hygiene should not escalate rampant caries (A) or advanced periodontal disease (B), nor does it inherently worsen systemic health

outcomes (D). Indeed, better oral hygiene can have a positive ripple effect on overall well-being.

161. (C) OHI-S (Simplified Oral Hygiene Index)

The OHI-S, established by Greene and Vermillion, consists of two components: the Debris Index and the Calculus Index, each scored on selected surfaces of six index teeth. By evaluating both soft and hard deposits independently, it provides a clear picture of an individual's oral hygiene status. The DMFT (A) targets decayed, missing, and filled teeth due to caries. The CPITN (B) assesses periodontal health and treatment needs, while the Gingival Index (D) measures inflammatory changes in the gingiva. Therefore, (C) is the distinct index suited for analyzing both plaque (debris) and calculus on chosen teeth.

162. (B) Scoring the gingiva based on color, consistency, and bleeding

The Gingival Index proposed by Löe and Silness examines the tissue around each tooth to determine gingival health. Evaluations revolve around color changes, swelling (consistency alterations), and the presence or absence of bleeding on gentle probing. This index categorizes gingival conditions from healthy (no bleeding or color change) to severe inflammation (marked redness, edema, and spontaneous bleeding). Option (A) aligns with caries-related indices like DMFT, and calculus detection (C) is captured by indices such as the OHI-S or the Calculus Index. Tallying coronal restorations (D) is not relevant to a gingival-focused measure.

163. (A) CPI focuses on periodontal status; DMFT measures caries experience

The CPI (formerly CPITN) documents signs of periodontal disease, scoring each sextant based on bleeding, calculus presence, and pocket depths. This index indicates treatment needs for gingival and periodontal conditions. In contrast, the DMFT index reflects the burden of caries in permanent dentition, accounting for decayed, missing (due to decay), and filled teeth. Neither index deals solely with fluorosis (B); that is evaluated by indices like Dean's Index. CPI does not track filled teeth exclusively (C), and DMFT does not focus on calculus. Consequently, their primary distinction lies in gum-focused assessment versus caries-focused measurement.

164. (C) A is true, but R is false

The def index (decayed, extracted due to caries, filled) quantifies caries experience in primary (deciduous) teeth among children, making the assertion correct. This index highlights the extent of disease and treatment in baby teeth. However, the reason is incorrect: def stands for decayed, extracted (due to caries), and filled, not "edematous." By noting the status of each primary tooth, def helps identify risk levels and plan pediatric oral health interventions. Hence, while def is indeed key for evaluating children's caries experience, the stated acronym definition is inaccurate, making (C) correct.

165. (C) Including coronal caries lesions in the CPI record

The CPI aims to gauge periodontal health by examining bleeding, calculus deposits, and pocket depths using a specialized WHO probe. It assigns a code representing the worst periodontal condition in each sextant. Hence, employing the correct probe (A), capturing the highest code (B), and identifying bleeding or calculus (D) all align with CPI guidelines. Coronal caries lesions, however, fall outside the CPI's scope, which focuses exclusively on periodontal indicators. Caries details are assessed by caries-specific indices (e.g., DMFT), not CPI. Therefore, adding coronal caries scores to CPI is an incorrect step in standard periodontal assessment protocols.

166. (C) The degree to which results can be generalized to broader populations

External validity, also called generalizability, addresses whether a study's outcomes remain accurate for populations or settings beyond the original sample. For instance, if a survey of oral hygiene practices among 10-year-olds in one region can predict patterns in other regions or ages, it exhibits good external validity. Option (A) describes internal validity, focusing on the study group's specific results, and (B) references reliability or repeatability. Meanwhile, (D) pertains to how meticulously one tooth or subject is evaluated, which falls under measurement precision rather

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than general applicability. Thus, (C) encapsulates the core meaning of external validity.

167. (B) Cohort study

A cohort study enrolls individuals who are free of the disease or outcome in question, then tracks them prospectively, noting exposures (e.g., sugar intake, tobacco use) to discern who eventually develops the condition. This enables researchers to calculate incidence rates and establish a temporal link between cause and effect. Cross-sectional designs (A) capture data at one point in time, while case-control studies (C) begin with diseased vs. non-diseased groups to look retrospectively for exposures. Ecological studies (D) examine population-level data without individual-based tracking. Hence, (B) specifically describes a forward-looking approach central to many public health investigations.

168. (A) It measures exposure and outcome at the same time, not showing temporal sequence

In cross-sectional studies, data on both exposure (e.g., sugar intake) and the outcome (e.g., dental caries) are collected simultaneously. While useful for gauging prevalence and associations, this design cannot confirm which came first—high sugar consumption or the carious lesions—limiting causal inference. Determining that sugar intake preceded caries development is crucial for causal claims. Option (B) describes an ecological approach focusing on aggregated data, while (C) is incorrect since surveys can measure caries prevalence. Extended follow-up (D) would characterize a longitudinal or cohort study, not a cross-sectional one. Hence, the lack of temporal clarity remains the major limitation.

169. (C) A is true, but R is false

RCTs generally represent a high tier of evidence in clinical research because random assignment to intervention or control groups reduces selection bias, helping isolate treatment effects. This robust design typically can also address many confounding factors by balancing participant characteristics across groups. The reason (R) falsely states that RCTs "cannot control for confounding variables at all," which is incorrect, as randomization and other design elements (e.g., stratification) specifically aim to minimize confounding. While no study design is absolutely perfect, RCTs remain among the best in limiting biases. Consequently, the assertion is true, but the stated reason is false.

170. (C) Recruiting only participants who are known to have advanced oral diseases

Reducing bias requires measures that ensure objectivity and representativeness. Calibrating examiners (A) helps maintain consistent scoring across different individuals. Employing validated indices (B) offers uniform criteria for conditions like caries or periodontal disease. Random sampling (D) enables each potential participant an equal chance of selection, preventing systematic over- or under-representation. In contrast, enrolling only individuals with severe oral disease (C) skews results, making it impossible to accurately reflect the general population. Such a selection method introduces selection bias, as it excludes the subpopulation without disease, rendering the survey less valid for broader epidemiological conclusions.

171. (A) Initiate routine fluoride mouth rinses with parental consent

In a school setting, applying fluoride mouth rinses on a scheduled basis is a proven strategy to reduce caries, especially in areas with limited dental care access or insufficient fluoride exposure. However, parental or guardian consent is necessary for ethical and legal compliance. Rinsing with soda (B) can heighten acid exposure and undermine preventive efforts. Cosmetic procedures like bleaching (C) do not address underlying disease. Mandating expensive electric brushes (D) may be cost-prohibitive and unsustainable, especially if families have financial constraints. Thus, integrating fluoride rinses under proper oversight emerges as the most pragmatic initial step for sustainable caries reduction.

172. (A) Sealing non-carious fissures for at-risk children

Pit-and-fissure sealants protect vulnerable occlusal surfaces, reducing bacterial retention and preventing lesion development. By applying these on at-risk children or those showing early signs of caries, the school effectively minimizes future tooth decay. Monthly extraction campaigns (B) are extreme and fail to preserve tooth structure. Providing sugary snacks (C) directly increases cariogenic risk, while

cosmetic veneers (D) offer no preventive value and address only aesthetic aspects. Sealing intact but high-risk fissures aligns with a conservative, preventive approach crucial to controlling caries progression and securing better long-term oral health among the school population.

173. (B) Training teachers and obtaining parent buy-in

Implementing new oral health routines demands consistent reinforcement by on-site staff—teachers who see children daily. Training them in correct brushing and mouth rinse protocols bolsters compliance and allows them to monitor student participation. Meanwhile, parental support helps maintain continuity at home, ensuring children adopt healthy oral hygiene behaviors beyond school hours. Extracting all decayed teeth (A) addresses only advanced disease, not ongoing prevention. Orthodontic screenings (C) or sedation camps (D) lack direct impact on caries prevention in resource-limited contexts. Consequently, building teacher capacity and engaging parents become cornerstones for a lasting, comprehensive school-based oral health initiative.

174. (B) Sustained school programs integrate continuous education and follow-up, while camps offer temporary relief without long-term reinforcement

Short-term dental outreach camps can offer basic examinations, immediate extractions, or minor restorations but rarely provide continued oversight or incremental preventive measures. In contrast, a structured school oral health program weaves consistent instruction, supervised brushing sessions, and repeated screenings into the academic routine, ensuring that preventive measures persist over weeks and months. Option (A) reverses this logic, as daily brushing support is more characteristic of comprehensive school initiatives. Both settings can address preventive strategies, invalidating (D). The main difference is whether follow-up and reinforcement exist, making (B) the accurate statement about long-term outcomes.

175. (C) Integrating preventive measures into primary care systems

Many national oral health policies stress embedding preventive dentistry into broader primary healthcare. This ensures early detection of conditions like caries or periodontitis in settings where patients frequently interact with healthcare professionals. By promoting shared resources, such as fluoride varnishes, dietary counseling, and hygienic education, these policies raise the overall health standard while reducing treatment costs. Imposing high out-of-pocket expenses (A) or restricting services in marginalized communities (B) escalates disparities. Keeping oral health separate from general healthcare (D) ignores systemic links between oral and overall well-being. Thus, cohesive integration fosters equitable and effective population-level oral health improvements.

176. (A) Both A and R are true, and R is the correct explanation of A

Organizations like the WHO and FDI World Dental Federation highlight the importance of targeting younger populations to prevent dental caries. By teaching proper brushing, limiting sugar intake, and applying topical fluorides, these programs reduce early lesions and embed positive routines. Engraining such habits in childhood extends into adulthood, potentially reducing advanced restorative needs later. Therefore, the assertion (A) stands correct. The reason (R) accurately explains this focus: forming beneficial oral hygiene behaviors early can have enduring effects, leading to a healthier dentition and fewer costs over a lifetime. Hence, both statements are true and closely interlinked.

177. (C) Prohibiting all forms of restorative treatments

Global oral health policy frameworks typically encourage robust preventive measures, from fluoridation strategies to dietary modifications, to curtail disease onset. They often include tobacco cessation advocacy, recognizing the link to oral cancers. Even with strong prevention, restorative treatments remain essential for existing conditions. Completely prohibiting such treatments (C) would be counterproductive and unethical, neglecting patients with advanced decay or structural damage. Hence, (C) fails to align with recognized international guidelines, which favor a balanced approach: prioritizing prevention but providing necessary restorative care. Measures (A), (B), and (D) align well with standard policy recommendations.

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178. (C) These populations often face higher disease burdens due to limited access and socioeconomic barriers

Underserved communities frequently suffer from inadequate oral healthcare infrastructure, leading to delayed treatment and progression of preventable diseases. Economic constraints, scarce dental professionals, and limited awareness compound these gaps, creating higher overall disease burdens. Caries rates, periodontal conditions, and edentulism can be more prevalent where resources are scarce. Contrary to (A), they tend to show higher, not lower, rates of disease. Manpower concentration (B) generally favors urban or affluent areas, not underserved ones. Lastly, advanced cosmetic treatments (D) represent neither a priority nor a common request where fundamental preventive and curative care remains challenging. Hence, (C) captures the core reason.

179. (C) High-income countries may emphasize complex, high-tech services once basic care is universal, while low-income areas concentrate on fundamental prevention and primary care access

In well-resourced settings, basic services—like regular exams, prophylaxis, and restorative treatments—are frequently accessible, allowing policy makers to invest further in sophisticated procedures, advanced technology, and specialized care for complex conditions. By contrast, in low-income regions, infrastructure challenges and workforce shortages often necessitate focusing on cost-effective preventive approaches (e.g., fluoride, sealants) and training mid-level providers for simpler restorations or extractions. Neither group entirely neglects prevention or advanced treatment, but policy priorities differ based on current infrastructure and resource constraints. Hence, (C) aptly describes the typical contrast, whereas other options (A), (B), and (D) are inaccurate generalizations.

180. (B) Strengthen primary dental services with mid-level providers, deploy preventive programs (fluoridation, sealants), and establish referral systems

In nations facing resource constraints and vast rural populations, practical, far-reaching interventions are vital. Training mid-level dental providers (e.g., dental therapists) can expand care capacity, while community-wide prevention—such as water fluoridation and sealant application—reduces new disease. Building referral systems ensures that complex cases still receive specialized attention in higher centers. Cosmetic services (A) target a narrow population and neglect pressing disease burdens. Relying on private clinics alone (C) excludes low-income groups. Enforcing daily extractions (D) is extreme and counterproductive. Consequently, (B) merges a cost-effective, preventive approach with strategic referrals to raise overall oral health standards.

181. (B) Provision of mobile dental clinics offering basic restorative services and preventive education in remote locations

Mobile clinics bring dental care directly to underserved populations, providing immediate interventions—like fillings or extractions—to manage acute problems and reduce extensive travel burdens. Additionally, preventive education delivered on-site can instruct individuals on oral hygiene, fluoride use, and dietary modifications, reducing future disease incidence. Option (A) doesn't solve the absence of professional care or address complex oral needs. Luxury city clinics (C) are inaccessible for financially constrained, remote dwellers. Simply banning all sugary foods (D) is impractical and insufficient on its own. Thus, bringing services and education to the community is the most impactful and equitable public health measure.

182. (B) Gentle scaling, plaque-control instruction, and conservative restoration of the painful tooth

Pregnant women often experience heightened gingival inflammation due to hormonal changes, necessitating professional cleaning (gentle scaling) and consistent plaque control instructions. Providing a conservative restoration for the symptomatic tooth is safe in the second trimester, preventing the lesion from worsening. This approach aligns with public health principles by focusing on minimal intervention, cost-effectiveness, and maternal well-being. Simply offering analgesics (A) neglects the underlying cause. Multiple extractions (C) can be overly aggressive and detrimental to long-term function. Complex periodontal surgery under general anesthesia (D) typically isn't a first-line

measure in moderate gum issues, especially during pregnancy without compelling indications.

183. (A) Deploy mid-level providers for routine care, introduce supervised brushing in schools, and legislate reduced sugar availability

In regions with pronounced caries and limited professionals, training mid-level personnel (e.g., dental hygienists, therapists) to deliver basic restorative and preventive services extends coverage more effectively. Encouraging supervised brushing in schools addresses risk behaviors early, reinforcing healthy habits among children. Legislating to limit sugary snacks in or near school premises reduces easy access to cariogenic foods. Funding only private clinics (B) benefits mostly urban or affluent populations. Halting preventive initiatives (C) and focusing on surgeries is neither cost-effective nor sustainable. Restricting education to older students (D) misses younger, high-risk groups. Hence, (A) synthesizes comprehensive, wide-reaching interventions.

184. (B) Training local nurses for basic dental screening, encouraging parental engagement, and offering fluoride solutions

National oral health coalitions typically focus on scaling prevention strategies to reach underserved groups. Equipping local nurses with foundational dental screening abilities integrates oral health checks into broader primary care services, reducing missed cases. Engaging parents supports consistent hygiene practices at home, improving daily plaque removal and dietary choices. Offering fluoride—whether through rinses, varnishes, or toothpaste—provides an evidence-based, cost-effective measure for caries reduction. Supporting sugary drinks in schools (A) elevates caries risk, while centralizing care at major hospitals (C) excludes remote regions. Catering only to elites (D) is the antithesis of broad public health coverage, thus (B) is correct.

185. (B) Provide universal coverage for essential preventive and restorative measures

WHO promotes universal access to primary healthcare services, including oral health. Ensuring that communities can obtain crucial preventive interventions (e.g., fluoride) and essential restorations (e.g., fillings for caries) forms part of an equitable approach. By prioritizing universal coverage, oral health becomes more attainable for various socioeconomic groups, reducing disparities. Restricting services to wealthy clinics (A) fosters inequality, while daily bleaching (C) is a non-essential cosmetic procedure. Forbidding mid-level provider training (D) hinders workforce expansion in rural or underserved regions. Thus, universal coverage remains a cornerstone principle in advancing global oral health equity.

186. (C) Increased risk of oral pre-cancer and cancer

Heavy tobacco-chewing correlates strongly with oral leukoplakia, submucous fibrosis, and malignant changes in the oral epithelium. Survey findings of persistent ulcers or growths in a high-risk population must prompt concern for pre-cancerous or cancerous lesions. Denture-related stomatitis (A) typically presents in edentulous or partially edentulous individuals wearing ill-fitting prostheses, unconnected to chewing tobacco. Anxiety-based bruxism (B) might cause wear facets or muscle pain but not the suspicious lesions described. Although some ulcerative conditions can be benign, the synergy of tobacco use, suspicious growths, and mucosal changes suggests close monitoring for malignant transformations, making (C) the most plausible concern.

187. (B) Painless, persistent ulceration or lump on the tongue or oral mucosa

Oral cancers often present as non-healing ulcers or growths, potentially lacking pain initially—a dangerous sign because painless lesions can go unnoticed. If an ulcer persists for more than two weeks, or a lump shows progressive changes, referral to a specialist is critical. Tooth sensitivity (A) often indicates enamel or dentinal hypersensitivity, not typically malignancy. Occasional bleeding due to overzealous brushing (C) points toward gingival irritation, while transient jaw discomfort (D) can stem from TMJ issues or bruxism. Thus, a painless, persistent mucosal lesion remains a classic red flag demanding further investigation for malignancy.

188. (B) Continuous, systematic collection and analysis of data regarding oral diseases and risk factors to guide actions

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Public Health Surveillance involves ongoing gathering and interpretation of health-related data to shape policies and interventions. In oral health, this could entail tracking caries prevalence, periodontal disease, fluoride usage, or tobacco habits in various communities. Such consistent monitoring informs resource allocation, prevention campaigns, and targeted efforts to reduce disease. Rather than focusing on private profits (A) or single-patient management (C), surveillance addresses the broader population. Random condemnation of non-fluoridated zones (D) is adversarial and unstructured, contrasting with the systematic, evidence-based framework that surveillance fosters. Hence, (B) encapsulates the purposeful approach to guide meaningful public health initiatives.

189. (A) Municipal initiatives handle direct implementation for smaller areas, while national policies set broader frameworks and regulations

National policies typically articulate overarching objectives and resource allocations for the entire country, including oral health guidelines or legislative measures. Meanwhile, local or municipal programs customize these high-level directives to address specific community needs, logistical realities, and cultural factors. They carry out day-to-day operations such as fluoride adjustments in water plants, school-based interventions, or local health worker training. Suggesting that national bodies never engage in regulation or funding (B) is inaccurate. Municipal initiatives do not necessarily eliminate the need for legislation (C), and their scope differs from national-level policy (D). Thus, (A) correctly characterizes their distinct roles.

190. (A) Launching supervised after-school brushing programs with routine plaque checks

Plaque accumulation primarily results from inadequate or incorrect oral hygiene. By introducing supervised brushing sessions, the department ensures that teens practice proper technique and frequency. Adding routine plaque evaluations motivates ongoing improvement. Meanwhile, advanced periodontal surgery (B) treats established damage but does little for large-scale prevention. Posterior implants (C) offer no direct solution to current plaque issues, and handing out sweets (D) exacerbates caries risk. Consequently, a structured brushing initiative combined with tangible feedback (plaque checks) aligns with effective public health strategies to instill better hygiene habits and lower disease rates.

191. (B) Introducing low-cost removable partial dentures and preventive education

In communities where affordability restricts access to advanced treatments like implants or extensive fixed prostheses, providing basic but functional partial dentures can restore chewing efficiency and aesthetics. Coupling this service with preventive education—targeting plaque control, diet, and timely check-ups—can halt further tooth loss. Bleaching (A) only addresses cosmetic concerns and ignores functional deficits, while denying care (C) intensifies health disparities. Root canal therapy for missing teeth (D) is nonsensical, as those teeth have already been lost. Thus, cost-effective removable partial dentures plus education reflect a public health orientation that balances resource limitations with essential oral rehabilitative needs.

192. (B) It allows a coordinated approach to shared risk factors, such as diet and tobacco use

Oral diseases often share risk factors with systemic conditions, including poor nutrition, smoking, and inadequate hygiene. By aligning oral health programs with broader healthcare structures, professionals can tackle these determinants more comprehensively. For example, an integrated system can simultaneously target tobacco cessation to reduce oral cancer risk and heart disease, or promote healthy diets that decrease both caries and obesity. Suggesting no systemic link (A) is incorrect, and restricting professionals (C) or duplicating tests (D) are drawbacks rather than advantages. Hence, a collaborative framework helps address overlapping causes and fosters more efficient preventive interventions.

193. (B) Oral candidiasis or potential neoplastic changes

Persistent erythematous lesions in older adults may indicate fungal infections (like candidiasis) or, in some cases, early neoplastic transformations (erythroplakia or erythroleukoplakia). These conditions can become serious if overlooked. Although denture-related stomatitis (A) is possible, especially if they wear dentures continuously without proper cleaning, the question states that

improved hygiene does not resolve the lesions, raising suspicion for something more systemic or pathological. Fractured alveolar bone (C) typically presents differently, with acute pain or trauma history, and impacted wisdom teeth (D) are less likely in older populations. Thus, candidiasis or neoplastic processes are the key considerations.

194. (B) Reduced sugar consumption among students, potentially lowering caries rates

Limiting aggressive marketing of sugary snacks and drinks can decrease the frequency with which children seek or purchase these items, helping reduce total sugar intake. Less sugar in the diet cuts the substrate available for acid-producing oral bacteria, thereby lowering the risk of carious lesions. The measure might not completely eliminate unhealthy snacking, but evidence suggests that restricting targeted advertisements contributes to healthier choices. This policy does not inherently necessitate advanced restorations (C) or universal extractions (D). While some children may still consume sugar, overall consumption trends often shift downward, improving broad oral health outcomes over time.

195. (A) The data alone cannot predict individual treatment likelihood; it only indicates a high prevalence of unmet needs

Cross-sectional findings reveal how common a condition is within the studied population at that time. Although 60% with untreated caries indicates a significant burden, the design neither clarifies future treatment-seeking behavior nor infers advanced disease progression for every case. It also cannot confirm that the remaining 40% face zero caries risk—some may develop it later. The data highlight the potential need for preventive or restorative interventions, but do not guarantee or precisely predict who will pursue such care. Thus, the best conclusion is that many individuals have unmet needs, but actual treatment likelihood remains uncertain.

196. (A) Provide sugar-free sweeteners, mobile restorative services, and dietary advice on minimizing sugar

Reducing high sugar intake is paramount to lessening caries risk, and introducing sugar-free alternatives can curtail acid production by cariogenic bacteria. Establishing mobile care access—whether through temporary clinics or periodic outreach—brings restorative treatments (e.g., fillings) closer to remote villagers, addressing immediate lesions. Dietary counseling further reinforces stable changes in tea consumption habits and daily snacking patterns. Recommending advanced implants (B) in a far-off city is not practical for cost or travel reasons. Halting brushing (C) would exacerbate decay. Bleaching sessions (D) fix cosmetic concerns but neglect the root causes of continuous caries. Hence, (A) is the holistic approach.

197. (B) Case-control study comparing those with rampant caries to those without, examining prior exposures

A case-control design is well suited for uncovering potential risk factors by retrospectively comparing those who already exhibit rampant caries (cases) to individuals free of such extensive decay (controls). By investigating their historical sugar consumption, oral hygiene routines, or access to fluoride, researchers can pinpoint exposures associated with disease occurrence. Ecological studies (A) rely on aggregate data, omitting individual-level correlations. Observing a single patient (C) cannot yield population-wide inferences. A randomized controlled trial about brushing frequency (D) might test an intervention's efficacy but does not primarily identify the broad risk factors that shape rampant caries in that community.

198. (B) Removing carious tissue manually and placing adhesive restorative material without mechanical drills

Atraumatic restorative treatment (ART) is a minimally invasive approach particularly beneficial in low-resource settings. It involves gently removing soft, demineralized dentin using hand instruments, then filling the cavity with a suitable adhesive material such as glass ionomer cement. This method negates the need for electricity, conventional drilling, or advanced sedation, simplifying care delivery in remote areas. Bleaching (C) addresses aesthetics, not untreated decay. Electric handpieces (A) or sedation (D) are absent from the ART philosophy, which prioritizes simplicity, cost-effectiveness, and patient comfort. Hence, the hallmark of ART is manual caries removal followed by immediate placement of adhesive filling.

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199. (D) Abolishing all prophylaxis to enhance natural healing

Public health strategies targeting periodontal well-being focus on prevention and early management. Broadly informing the populace about daily plaque control (A), addressing tobacco usage (B), and offering routine scaling or prophylaxis (C) in accessible clinics can reduce periodontal disease prevalence. In contrast, disbanding professional cleanings or prophylaxis (D) leaves calculus deposits and gingival inflammation unaddressed, potentially exacerbating periodontal breakdown. The notion that "natural healing" alone combats entrenched plaque and calculus is unfounded. Consequently, (D) is contrary to established periodontal disease prevention frameworks, making it the incorrect option in a public health context.

200. (A) Both A and R are true, and R is the correct explanation of A

When governments implement comprehensive oral health initiatives—such as community water fluoridation, school-based sealants, and accessible basic care—dental diseases often diminish in severity and prevalence. This, in turn, lowers the necessity for complex, high-cost interventions like root canals, crowns, or implants. Hence, overall treatment expenditures tend to drop over time, validating the Assertion. The Reason logically supports it: robust preventive approaches intercept pathology early, avoiding major reconstructive efforts. Because fewer citizens reach advanced disease stages, overall healthcare spending declines while population oral health improves. Thus, both statements are true, with the Reason accurately explaining the Assertion.

CHAPTER 07

CONSERVATIVE DENTISTRY AND ENDODONTICS

1. (C) Creating an appropriate form to restore function

   Tooth preparation in operative dentistry involves removing diseased or damaged tooth structure and designing the remaining tooth to allow placement of a restorative material that reinstates function and form. This term emphasizes not just removal of decay but also shaping cavity walls, establishing retention, and creating adequate space for the restorative material. Option (C) accurately reflects this holistic approach, while the other options focus on isolated tasks like aesthetics, crown placement, or polishing. Proper tooth preparation ensures the best prognosis, preserves healthy structure, and facilitates longevity of the final restoration.

2. (A) G.V. Black's classification

   G.V. Black's classification is a classical system emphasizing the site of the cavity (pits, fissures, interproximal surfaces) on anterior and posterior teeth. This location-centric approach helps students and clinicians systematically identify the type of cavity preparation required. Although newer systems like Mount and Hume or ICDAS incorporate severity or different risk factors, Black's original grouping remains a cornerstone of operative dentistry teaching because it addresses where on the tooth decay typically forms. WHO classification is epidemiologically oriented, and ICDAS focuses on lesion severity, making option (A) most consistent with the question's requirement.

3. (B) Proximal surfaces of posterior teeth

   In G.V. Black's classification, Class II lesions affect the proximal surfaces of premolars and molars. This classification highlights areas where plaque accumulation may lead to interproximal decay, which can undermine tooth integrity if not treated promptly. Class II differs from Class III, which involves proximal surfaces of anterior teeth without incisal angle involvement. Class I covers pits and fissures, and Class V involves the gingival third of the facial or lingual surfaces. Understanding Class II is critical for proper cavity preparation, as restorative techniques differ based on tooth type and lesion location.

4. (C) Convergent walls generally increase retention form

   In cavity preparation, convergence or divergence of cavity walls impacts how well a restoration is retained in place. Slightly convergent walls (moving occlusally) typically enhance mechanical retention by preventing the restoration from dislodging occlusally. Divergent walls, on the other hand, facilitate visibility and access but can reduce inherent mechanical grip of the filling material. Although bonding agents and other modern techniques compensate for divergence, slight convergence remains a classical principle. Option (C) is correct because convergent walls can enhance retention; divergent walls neither guarantee a perfect marginal seal nor eliminate microleakage entirely.

5. (C) Establishment of outline form

   In a stepwise approach to cavity preparation, creating the outline form comes before removing unsupported enamel or placing restorative materials. The outline form ensures that all carious or susceptible areas are included, facilitating proper access and visualization. While removal of unsupported enamel and final finishing are critical steps, they typically occur after the initial shape is established. Placing the restoration is among the final steps. By establishing the outline form first, the operator ensures precision in locating margins, controlling potential undercuts, and planning the final restoration for optimal retention and resistance.

6. (B) Resistance form

   Resistance form in cavity preparation involves shaping the cavity and its walls so both the tooth and restoration can endure the forces of mastication without fracture. This typically includes flat pulpal

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floors, rounded internal line angles, and adequate bulk of restorative material at areas subject to stress. While retention form helps prevent dislodgement, resistance form is specifically designed to withstand occlusal loads. Convenience form is about ensuring adequate operator visibility and access, and outline form defines the overall shape. Thus, ensuring robust resistance form mitigates the risk of restoration fracture under masticatory forces.

7. (C) Reduction of healthy cusps

Internal wall preparation aims to create the correct dimensions and geometry to support the restorative material. It includes ensuring sufficient cavity depth to accommodate restorative material, shaping walls that either parallel or slightly converge for mechanical retention, and smoothing internal line angles to reduce stress concentration points. Reducing healthy cusps without a reason is typically avoided as it compromises tooth integrity and needlessly removes tooth structure. Minimally invasive dentistry principles guide dentists to preserve as much sound tooth tissue as possible, so option (C) is the exception among the listed objectives.

8. (C) Greater risk of restoration dislodgement

Excessive divergence means the walls flare outward more than recommended, which reduces the natural mechanical lock that helps keep a restoration in place. Retention relies significantly on opposing forces when the cavity converges slightly or remains parallel. When divergence is too extreme, the restoration can be pushed or pulled out more easily during masticatory movements and other stresses. While bonding agents and modern adhesives partially compensate for this issue, mechanical retention remains an important element. Hence, option (C) correctly identifies the adverse effect on retention when cavity walls diverge excessively.

9. (C) Cutting a beveled cavosurface margin on occlusal enamel

For most Class I preparations on posterior teeth, the occlusal margins are finished as butt joints or slightly beveled only in specific composite restorations. A routine, pronounced bevel on occlusal enamel is typically not recommended because it can create thin edges of enamel prone to fracture and is not always necessary for amalgam or certain composite techniques. Refining line angles, ensuring adequate depth, and removing caries are correct steps. Therefore, option (C) is considered incorrect in a traditional Class I approach because it does not routinely improve retention or resistance in occlusal preparations.

10. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

In Class II cavity preparations, slight divergence of the proximal box can facilitate placement of a matrix band and reduce unwanted undercuts. This makes it easier to place and adapt restorative materials in the contact area between adjacent teeth. Hence, the assertion that dentists create divergent proximal walls for convenience is accurate, and the stated reason logically connects to why they do so—fewer undercuts and simpler matrix placement. Although complete divergence can reduce retention, a carefully managed divergence is a practical trade-off, making both statements true and the Reason a valid explanation for the Assertion.

11. (D) Round bur in a handpiece

Retention grooves are often created using a small round bur in a slow-speed handpiece to provide controlled cutting in specific areas of the cavity. This approach enables the operator to place retention features in dentin without excessively weakening tooth structure. While hand instruments like enamel hatchets, margin trimmers, and spoon excavators are crucial for refining cavity walls or removing decay, the precise nature of groove placement is typically best accomplished with a bur. Using the correct bur size allows for a measured depth, ensuring mechanical retention where bonding or undercut requirements are indicated.

12. (A) Convergent incisal and gingival walls

In a Class V abrasion lesion, retention must ensure the material remains in place despite minimal occlusal load and potential stress from brushing or mastication forces near the cervical margin. Convergent incisal and gingival walls, possibly accompanied by subtle retentive grooves, create a mechanical lock to prevent dislodgment. Bonding alone is often insufficient if microleakage or moisture contamination occurs. A tapered

preparation would compromise retention. Therefore, slight convergence of incisal and gingival walls is recommended to enhance the physical retention of the restoration in these cervical areas.

13. (A) Rounded line angles

Rounded internal line angles in a Class I preparation evenly distribute occlusal stress and reduce localized stress concentrations that can crack enamel or weaken the restoration. Sharp line angles are vulnerable points, where stress can accumulate and lead to fracture of tooth or restoration material. A shallow pulpal floor may not provide sufficient thickness of restorative material, while excessive divergence compromises retention. By rounding the line angles, dentists minimize stress peaks during mastication. Hence, option (A) supports better tooth-restoration longevity by lessening the likelihood of fracture under normal and parafunctional forces.

14. (C) Preserving marginal ridge if structure is intact

In slot preparations for Class II restorations, the philosophy of minimally invasive dentistry encourages removal of only diseased tissue. If the marginal ridge is structurally sound, preserving it helps maintain tooth strength. Overextending occlusal or proximal walls unnecessarily undermines healthy structure and can weaken the tooth. Affected dentin that can remineralize with appropriate liners is sometimes left, but definitely not all affected tissue. The best balance is achieved by carefully removing irreversibly damaged dentin and preserving the marginal ridge whenever possible. This practice upholds strength and longevity of the tooth-restoration complex.

15. (C) Retain as much healthy tooth structure as possible

Minimally invasive dentistry emphasizes preserving healthy tooth structure by removing only irreversibly compromised or infected dentin. Under this approach, clinicians aim to conserve tooth vitality and strengthen the remaining structure. Complete removal of all discoloration can lead to over-preparation, while blindly maximizing cavity width ignores the principle of preservation. Mechanical undercuts are useful in certain restorative materials (e.g., amalgam) but not universally needed due to advancements in bonding technologies. Thus, the best answer is retaining healthy structure whenever feasible, adhering to principles of conservative cavity preparation and maintaining long-term tooth integrity.

16. (D) Prevent cusp fracture under function

When a tooth's cusps are undermined by extensive caries or cavity preparation, covering them with restorative material significantly reduces the risk of fracture during normal chewing forces. Amalgam restorations do not bond chemically to tooth structure, requiring mechanical retention and sometimes extra protection. Esthetics is not a core reason for cusp coverage when using amalgam. While contact point establishment and retention are important, the main concern is to protect compromised cusps from fracturing. Hence, cusp coverage is planned chiefly for structural reinforcement and long-term tooth survival.

17. (C) High occlusal contact or premature contact

Sharp pain on biting often arises when the restoration sits too high or prematurely contacts the opposing tooth, concentrating forces abnormally on that restored area. This can transmit excessive stress to the pulp or periodontal ligament, causing a jolt of pain. Proper occlusal checks and adjustments, typically done with articulating paper, are crucial to prevent hyperocclusion. Ensuring adequate pulpal depth, rounding line angles, and ensuring no occlusal contact at all may not necessarily eliminate biting discomfort if the restoration is high in select areas. Hence, addressing the high occlusal spot is paramount.

18. (A) Amount of healthy tooth preserved

Air-abrasion techniques can remove decay selectively, often sparing more healthy tooth structure than conventional bur-based approaches. Traditional hand-cut methods use burs that may require a definitive outline form, potentially leading to larger preparations. Air-abrasion uses a fine powder stream to abrade diseased structure and can be more precise, provided caries is superficial or well-defined. Both techniques might use isolation to maintain a clear operative field, and removing enamel rods is possible in both. The biggest difference is the conservative nature of air-abrasion,

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which frequently preserves extra healthy tooth structure.

19. (B) Radiolucency beneath an apparently intact occlusal surface

A radiolucency visible on a bitewing or periapical radiograph that lies beneath an occlusal surface with no obvious cavitation is a strong indicator of hidden dentinal caries. The outer enamel may remain intact or only slightly decalcified, yet the lesion can be extensive in the dentin. Minimal staining or shallow pits without discoloration may be superficial or non-carious. The absence of symptoms does not rule out deeper decay, as some carious lesions remain asymptomatic until significant tooth structure is compromised. Hence, a radiolucency with seemingly intact enamel demands further investigation.

20. (C) Laser fluorescence device (e.g., DIAGNOdent)

Laser fluorescence caries detection devices are highly sensitive tools that measure changes in tooth structure by detecting fluorescence differences in demineralized areas. Fissure caries often develop beneath a relatively intact surface, making them difficult to detect visually or through radiographs until significant dentinal involvement occurs. Tactile probing with a sharp explorer may damage or create iatrogenic defects in weakened enamel. Dye staining is more common in operative caries removal, and standard visual inspection may miss early lesions. Thus, laser fluorescence devices offer a more accurate, noninvasive detection method.

21. (B) A thin coating placed to protect the pulp

A dental liner is applied in minimal thickness on the pulpal or axial walls of a preparation to provide a protective barrier against thermal shock, chemical irritation, and microleakage. It does not serve as a bulk substitute for missing tooth structure; rather, it acts as a biologically compatible interface between the restoration and the tooth. Thicker restorative bases, by contrast, offer structural support, and finishing materials help polish restorations. Abrasive compounds remove debris or stains. Hence, a “thin coating to protect the pulp” is the correct core definition of a liner.

22. (B) Providing bulk support and thermal protection

A base, typically thicker than a liner, is placed to replace lost dentin, offering both mechanical support and insulation against temperature changes. Materials like glass ionomer or zinc phosphate cement are commonly used. While a bonding agent enhances adhesion and a liner protects the pulp, a base compensates for significant structural defects to support the final restoration and reduce harmful thermal conduction toward the pulp. Bases are not primarily intended to replace the need for enamel bonding or finishing. Therefore, the best and most direct function of a base is bulk support and insulation.

23. (D) Composite resin

Calcium hydroxide, zinc oxide eugenol, and resin-modified glass ionomer cements are all recognized liners that protect the pulp by sealing the dentin and releasing beneficial ions, such as fluoride or hydroxyl. Composite resin, on the other hand, is primarily a final restorative material rather than a protective liner. Although thin increments of flowable composite can be placed in some clinical techniques, standard composite resin does not function as a classic liner. Hence, among the choices, composite resin (D) is the least likely to be used exclusively for liner purposes in routine restorative care.

24. (C) Strong compressive strength comparable to dentin

Calcium hydroxide liners are valued for their ability to stimulate reparative dentin formation, neutralize acidic materials, and maintain a bacteriostatic environment due to their high pH. However, they possess relatively low compressive strength and cannot reliably support heavy masticatory forces on their own. This contrasts with the mechanical strength of dentin or more robust base materials. That is why liners are used in thin layers primarily for pulpal protection rather than structural support. Consequently, option (C) is the incorrect statement about calcium hydroxide’s typical properties.

25. (C) Assertion is false, but Reason is true.

Although zinc oxide eugenol is an excellent sedative base, eugenol-containing materials inhibit the polymerization of resin-based composites.

Therefore, placing ZOE directly underneath composite restorations is contraindicated because the eugenol can compromise the bond, leading to restoration failure. Another eugenol-free intermediate layer or alternative base should be used. The Reason is indeed true—eugenol disrupts polymerization. However, the Assertion stating ZOE "can be placed as a base under a composite restoration" is typically false due to that chemical incompatibility. Therefore, option (C) best fits the relationship between the Assertion and Reason.

26. (C) A thin layer of calcium hydroxide covered by a stronger base

For deep preparations close to the pulp, a thin layer of calcium hydroxide liner promotes reparative dentin formation and acts as an antibacterial shield. However, calcium hydroxide's low compressive strength necessitates a second material, often a glass ionomer or resin-modified glass ionomer, placed on top to provide structural support before final restoration. Using pure zinc oxide eugenol alone may affect resin restorations and lacks enough strength under heavy load. Omitting a liner can risk pulp irritation, and thick composite resin doesn't function as a traditional base or encourage dentinal bridge formation.

27. (B) Glass ionomer cement

Glass ionomer cement is well-known for its sustained fluoride release, which can help remineralize adjacent tooth structure and reduce secondary caries. It also bonds chemically to dentin and enamel, enhancing overall restoration retention. Calcium hydroxide paste is more aligned with stimulating reparative dentin and neutralizing acid, but it does not exhibit the same level of fluoride release. Polycarboxylate and zinc phosphate cements offer good mechanical properties but lower or no significant fluoride release compared to glass ionomer. Consequently, glass ionomer cement stands out for fluoride-releasing benefits.

28. (C) It combines some resin properties with fluoride release

Resin-modified glass ionomer cements (RMGICs) incorporate light-curable resins into the conventional glass ionomer formula, enhancing physical properties, setting characteristics, and bonding strength while retaining fluoride release. This leads to improved moisture tolerance and superior mechanical properties compared to traditional glass ionomer. Although partial moisture control is still necessary, RMGIC does not entirely eliminate the need for a liner in extremely deep cavities. Nor is it completely impervious to oral fluids. Hence, its appeal lies in blending resin's resilience and adhesive advantages with glass ionomer's chemical bond and fluoride-related benefits.

29. (B) Glass ionomer cement

In deep preparations, a layered approach using calcium hydroxide for direct pulp protection, topped with a stronger base, helps safeguard pulpal health. Glass ionomer cement is ideal for the second layer because it seals dentin, provides mechanical support, and releases fluoride to prevent secondary decay. Its chemical bond to tooth structure further supports the restoration. Zinc oxide eugenol can inhibit resin polymerization, while polycarboxylate lacks fluoride benefits. Amalgam is a final restorative material, not a base or liner. Therefore, glass ionomer cement over calcium hydroxide addresses both protection and support.

30. (C) Add a suitable base to reinforce the liner if needed

When a cavity is deep, a liner alone generally lacks sufficient structural integrity to support occlusal forces. Placing a compatible base, such as glass ionomer or resin-modified glass ionomer, over the liner helps reinforce the restoration. Immediately filling the entire cavity with glass ionomer or directly condensing amalgam onto a fragile liner may risk liner fracture or chemical incompatibility. Varnish is often placed to reduce microleakage but only after any essential base is placed. Hence, option (C) is the most appropriate next step to ensure longevity and protect the pulp effectively.

31. (B) Lining with calcium hydroxide if dentin is very thin

Zinc phosphate cement is acidic upon initial mixing. In cases where the dentin is thin, a protective liner like calcium hydroxide is needed to prevent pulp irritation. Without this safeguard, the acidic nature could harm the pulp. Intentional pulp exposure is never a goal, and skipping any liner or varnish may

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lead to postoperative sensitivity. A resin bonding agent can be used in some modern approaches, but the most critical traditional measure remains the application of a liner under zinc phosphate if the remaining dentinal thickness is compromised.

32. (C) Extending liner up the cavity walls to the cavosurface

Liners are typically confined to the deepest areas of the preparation (pulpal or axial walls) to protect the pulp and minimize thermal conductivity. Extending the liner all the way to the cavosurface margin is not standard because it can weaken bond strength or create undesirable film thickness at the final margin. A minimal thickness layer is ideal to maintain adequate space for the restoration, and allowing the liner to fully set before placing a base or final restoration is recommended. Thus, applying the liner up the entire cavity wall is the incorrect step.

33. (C) Glass ionomer cement

Glass ionomer cement is renowned for its ability to form a chemical bond to enamel and dentin through an ionic exchange mechanism. This feature provides enhanced retention, reduces microleakage, and contributes to long-term success of restorations. Polycarboxylate cement also bonds chemically, but its mechanical properties and fluoride release are typically weaker compared to glass ionomer. Zinc phosphate cement relies primarily on mechanical retention rather than chemical bonding, and gutta-percha is used in endodontic obturation, not as a base or liner. Glass ionomer remains the benchmark for chemical bonding in restorative bases.

34. (B) Resin-modified glass ionomer cement

In cases with minimal dentin, a dentist often uses a liner like calcium hydroxide to maintain pulp vitality and encourage dentin bridge formation. Then, a base that provides good adhesion, fluoride release, and sufficient mechanical strength is ideal. Resin-modified glass ionomer cement excels in these properties, making it preferable over conventional zinc phosphate or polycarboxylate cement. ZOE may interfere with future bonding procedures. By combining resin components with glass ionomer, clinicians achieve enhanced mechanical properties and greater moisture tolerance, crucial for a cervical lesion in a structurally compromised tooth.

35. (C) Bonding agents chemically adhere to tooth structure, varnish merely provides a physical seal

Varnishes, typically resin solutions in a volatile solvent, help seal dentinal tubules and reduce microleakage temporarily. They do not form a chemical bond; rather, they create a superficial film once the solvent evaporates. Bonding agents, however, involve acid-etching and infiltration of primer and adhesive resin into the etched tooth surface, creating a micromechanical or chemical bond. Historically, varnish was used under amalgam restorations to minimize sensitivity and leakage. In contrast, bonding agents are mandatory for composite resins to adhere strongly to tooth structure and are not merely a physical barrier.

36. (C) They provide excellent thermal insulation

Resin bonding agents improve retention by creating micromechanical adhesion, often reducing the need for mechanical undercuts. They also help minimize microleakage by sealing the interface between the restoration and tooth. However, they are not known for significant thermal insulation compared to liners or bases like glass ionomer or zinc oxide eugenol. Since resin bonding agents are applied in a very thin layer, they do not act as effective insulators against temperature changes. Thus, claiming they provide “excellent thermal insulation” is an exception to typical properties of bonding agents.

37. (D) Varnish

Amalgam restorations conduct temperature changes readily, and without a protective layer, cold sensitivity can be pronounced. Although calcium hydroxide or glass ionomer can provide some degree of pulp protection, a varnish specifically seals dentinal tubules and reduces microleakage, lessening thermal conduction and post-operative sensitivity. Zinc oxide eugenol also helps but can interfere with resin restorations and is not universally used. The absence of a varnish layer in classic amalgam techniques often results in increased sensitivity because the metallic filling transfers heat (or cold) more efficiently to underlying dentinal tubules.

38. (B) Meticulous application of a bonding agent

Postoperative sensitivity in composite restorations frequently arises from microleakage, especially at the cervical or gingival margin, where bonding can be technique-sensitive. An inadequately placed bonding agent, insufficient curing, or contamination with saliva can compromise the seal. Thick zinc phosphate bases are seldom used under composite, and heavy abrasion at the gingival margin may actually degrade the bonding surface. Properly applying and curing the bonding agent prevents fluid movement and bacterial infiltration beneath the restoration, thereby reducing sensitivity. Thus, option (B) is the step most likely missed, leading to postoperative symptoms.

39. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Resin-modified glass ionomer (RMGI) is a versatile base for use beneath composite restorations because it offers fluoride release, low solubility, and compatible bonding to the tooth. The resin components within the glass ionomer also promote adhesion with the resin matrix in composites. Consequently, RMGI can create a solid transition layer between tooth structure and the final composite, reducing microleakage and increasing restoration longevity. Therefore, the Assertion is true, and the Reason provides the accurate scientific basis for its acceptance as a base under composite materials, making option (A) correct.

40. (A) Resin-modified glass ionomer

Resin-modified glass ionomer offers both chemical adhesion to dentin and fluoride release, helping mitigate secondary caries and microleakage. In a deep Class II cavity, it can act as a base layer under composite to cushion the restoration and improve the marginal seal, especially in the proximal box where bonding challenges are common. While compomers share some properties with composite, they lack the robust chemical bond of glass ionomer. Zinc oxide eugenol can interfere with resin polymerization, and polycarboxylate cement lacks fluoride release. Hence, RMGI is the optimal choice here.

41. (C) Tactile probing with a sharp explorer

Historically, dentists used a sharp explorer to "catch" in fissures, but this approach can cause iatrogenic enamel defects and may not reliably diagnose early caries. Visual inspection with magnification and good lighting, laser fluorescence (e.g., DIAGNOdent), and fiber-optic transillumination are more sensitive for detecting initial enamel demineralization. Tactile probing can also give false positives when a fissure is anatomically tight but not carious. Consequently, it is now considered the least reliable among listed methods, with modern techniques focusing on noninvasive, high-accuracy detection to preserve sound tooth structure.

42. (B) Preserving affected dentin that can remineralize

MID stresses the selective removal of irreversibly infected dentin while leaving behind partially demineralized dentin that retains a capacity to remineralize under favorable conditions. This approach reduces pulp exposure risk and preserves structural integrity. Complete removal of all stained dentin is outdated, as staining alone doesn't confirm infection. Widening preparations or routinely including all pits and fissures can lead to unnecessary tooth structure loss. Consequently, preserving potentially remineralizable dentin forms the core principle of MID, aiming for longevity of the tooth with minimal trauma.

43. (C) To promote secondary dentin formation and reduce pulp exposure risk

Modern caries management recognizes that certain layers of softened, affected dentin contain reparative cells and can recover if sealed properly from oral bacteria. Removing every bit of softened dentin risks an iatrogenic pulp exposure, especially in deep lesions, leading to more extensive treatment like root canal therapy. By leaving a sealed environment, the tooth can deposit secondary dentin, strengthening pulp vitality. The rationale is not about saving operative time or reducing tooth strength for future restorations; it is a biologically driven strategy to preserve tooth vitality and minimize invasive treatment.

44. (B) Sealing incipient lesions to arrest caries progression

Early enamel lesions may arrest or remineralize when effectively sealed from the oral environment and oral biofilms. Contemporary caries management prefers non-surgical or micro-invasive treatments

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if the lesion has not penetrated significantly into dentin. By covering the lesion with a sealant or resin infiltration, bacteria and fermentable substrates are prevented from perpetuating demineralization, giving the tooth a chance to heal. Surgical intervention at the earliest sign of decay can lead to overtreatment. Removing all stained enamel is unnecessary and can sacrifice healthy tooth structure. Thus, sealing incipient enamel caries is a valid, minimally invasive measure.

45. (B) Infected dentin is irreversibly demineralized; affected dentin may be remineralized

In the outermost zone of a carious lesion, infected dentin is heavily colonized by bacteria and structurally unsalvageable, necessitating complete removal. Affected dentin, located deeper toward the pulp, exhibits partial demineralization and lesser bacterial invasion. This layer can potentially regain mineral content if sealed off and protected from further insult. Consequently, the recommended strategy is to remove infected dentin while preserving affected dentin if it remains firm enough and shows potential for remineralization. This approach reduces the likelihood of pulp exposure and preserves as much tooth vitality as possible.

46. (B) Remove only irreversibly infected dentin

Minimal intervention dentistry prioritizes conservation of healthy tooth structure. Instead of the traditional "extension for prevention," modern approaches advocate removing only irreversibly infected dentin while leaving affected dentin if sealed effectively. Automatically capping the pulp, funnel-shaped preps, or including all fissures can result in needless tooth structure removal, contradicting minimally invasive principles. Retaining partially demineralized dentin that can remineralize under a well-sealed restoration aligns with this philosophy. Therefore, option (B) properly reflects the minimal intervention approach for a moderate lesion without risking pulp exposure or structural overcompromise.

47. (B) Place a liner if near the pulp and restore

Modern caries management recognizes that some discolored but firm dentin may be intact and capable of remineralization if adequately sealed. Total removal of stained dentin can compromise the tooth and risk pulpal exposure, particularly in deeper lesions. Root canal therapy is unnecessary unless there is irreparable pulp involvement. Simply observing without restoration leaves the lesion susceptible to further decay. Therefore, placing a liner if the pulp is threatened and proceeding with restoration ensures a sealed environment where any remaining affected dentin can stabilize or remineralize while the pulp remains protected.

48. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Traditional caries detection relies on visually spotting surface changes and using an explorer to identify softened enamel or dentin. However, incipient lesions that begin interproximally or are hidden by tooth morphology might remain undetected until they breach outer enamel. Bitewing radiographs are particularly adept at revealing demineralization in proximal areas where direct visual-tactile methods fail. This synergy explains why bitewings are standard in routine exams: they allow detection of early caries that might otherwise become advanced before diagnosis. Therefore, both statements are true, with the Reason accurately explaining the Assertion.

49. (D) Completely flattening the pulpal floor to remove all softened dentin

Modern deep caries management advises removing heavily infected or necrotic dentin at the periphery to ensure clean, sealable margins. If the pulp is at risk, leaving some partly affected but reasonably firm dentin helps avoid an unnecessary exposure. A sharp spoon excavator is appropriate for selective final checks. Flattening the pulpal floor strictly to remove all softened dentin contradicts minimally invasive methods, potentially increasing the chance of pulp exposure and reducing vital dentin that can remineralize. Therefore, option (D) is incorrect in a contemporary, conservative approach.

50. (B) Stop caries removal once firm, affected dentin is reached

In line with minimally invasive dentistry, the goal is to remove caries only until firm, affected dentin is encountered and avoid exposing or compromising the pulp. Overzealous excavation to remove every trace of discoloration can weaken the tooth or lead to

pulp exposure. Full-coverage crowns or prophylactic preparations are considered overtreatment in the absence of structural compromise or active decay in adjacent teeth. By stopping at firm dentin, the operator preserves healthy tissue and provides an environment for potential remineralization under a sealed restoration.

51. (B) A direct restorative material combining mercury with alloy powder

Dental amalgam is an alloy resulting from mixing a silver-tin-copper alloy powder with liquid mercury. Once triturated, the mass is condensed into a prepared cavity and hardens over time through an amalgamation reaction. It is distinguished from resin materials, which rely on polymerization, and ceramic or indirect restorations, which are fabricated outside the mouth. While amalgam has been used for many decades because of its durability and ease of placement, its mercury content and lack of esthetics have fueled the development of newer materials like composite and glass ionomer for many indications.

52. (C) Gamma-2 (Sn8Hg)

The gamma-2 phase (Sn8Hg) is the weakest and most corrosion-prone phase in conventional low-copper amalgams. Corrosion can lead to marginal breakdown over time. High-copper amalgams reduce the formation of this vulnerable phase by incorporating additional copper, which reacts preferentially with tin, forming the eta phase (Cu6Sn5) instead. The gamma (Ag3Sn) phase is the unreacted silver-tin alloy and contributes to strength, while the gamma-1 (Ag2Hg3) phase provides a matrix around those particles. Understanding each phase's properties helps clinicians select and handle modern high-copper amalgams to reduce corrosion and improve clinical longevity.

53. (C) Reduce weak phases and improve corrosion resistance

High-copper amalgams contain more copper, which reacts with tin to form the eta phase, thereby minimizing or eliminating the weaker gamma-2 (Sn-Hg) phase known for corrosion susceptibility. This results in a restoration with higher strength, less marginal breakdown, and enhanced long-term success compared to low-copper varieties. They do not increase mercury content nor do they completely eliminate mercury from the mixture. Instead, the improved physical properties come largely from limiting that corrosive gamma-2 phase. Consequently, high-copper amalgams have become the standard, offering better durability and lower chances of failure.

54. (C) Excellent esthetics for anterior teeth

Dental amalgam boasts strong compressive strength, is comparatively easy to place (even with moderate moisture contamination), and is typically less expensive than composite or ceramic alternatives. However, it lacks the ability to mimic natural tooth color, making it aesthetically unsuitable for anterior restorations where appearance is critical. Composites or ceramics typically outperform amalgam in high-visibility areas. Hence, while amalgam's cost-effectiveness and durability have kept it relevant in posterior teeth, it is not chosen for its esthetic quality, which makes option (C) the exception among the listed "advantages" of amalgam.

55. (B) Amalgam requires mechanical retention; composite relies on adhesion

Amalgam does not bond chemically to the tooth; it must be mechanically locked in via cavity design featuring retention forms and undercuts. During placement, it is condensed to adapt it closely to cavity walls and minimize voids, but it hardens through an internal amalgamation reaction rather than curing by light. Composite, in contrast, uses adhesive systems that chemically and micromechanically bond to enamel and dentin. It is placed incrementally and polymerized using a curing light. Heavy hand pressure is a hallmark of amalgam condensation, not composite. Thus, option (B) clearly distinguishes each material's retention mechanism.

56. (C) Condensing the amalgam in small increments

Amalgam must be thoroughly condensed to expel excess mercury and eliminate air voids for maximum density and strength. Condensation involves applying firm pressure with a properly sized condenser in overlapping steps. Placing large masses of amalgam at once can trap voids, compromising the final restoration. While suction

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helps control mercury vapor and debris, the fundamental technique that ensures minimal porosity is small incremental placement combined with directed, firm condensation. Burnishing also helps improve the surface and margins, but failing to condense properly from the start would undermine the restoration's mechanical integrity.

57. (A) Using a resin-based bonding system under the amalgam

Postoperative sensitivity in deep amalgam restorations often arises from microleakage and thermal conductivity. While a traditional liner or varnish can help seal tubules, many modern approaches incorporate a resin-based bonding agent between the tooth and amalgam. This technique, known as "bonded amalgam," can reduce microleakage and postoperative discomfort by improving the seal and diminishing fluid movement in dentinal tubules. Omitting a base or poor condensation can invite sensitivity, and immediate polishing isn't as critical as ensuring a good seal. Thus, option (A) is the most effective strategy for limiting sensitivity.

58. (B) Burnishing the margins after 24 hours

Once an amalgam restoration has fully crystallized (often after 24 hours), gentle burnishing of the margins can refine the interface between tooth and restoration, enhancing adaptation and reducing microleakage. Immediate polishing or burnishing is sometimes performed but can be more effective if done after the amalgam reaches higher strength. Overheating the amalgam or leaving the matrix band in place are not recommended procedures. Topping amalgam with composite is neither standard nor structurally coherent. Therefore, delayed burnishing remains the most recognized method to improve long-term margin quality and reduce leakage.

59. (D) Evaluate if a partial repair with amalgam is feasible

If most of the amalgam restoration remains sound, a localized repair or refurbishment can often be successful and cost-effective. A fractured marginal ridge may be rebuilt if proper isolation and mechanical retention can be achieved. Replacing the entire restoration or crowning the tooth is more aggressive and typically reserved for extensive failures or repeated fractures. Composite repairs over amalgam are done in specific situations but may not bond well without advanced hybrid protocols. Therefore, option (D) reflects the modern preference to preserve functional restorations through minimally invasive repair when possible.

60. (B) A soupy, weak mix

Trituration is the mechanical mixing of mercury with alloy powder. Undermixing generally yields a dry, grainy mass that lacks cohesive flow, while overtriturating can produce a shiny, soupy amalgam prone to weaker properties and excessive matrix formation. Overtriturated amalgam is harder to condense properly, trapping voids and leading to suboptimal strength. It neither eradicates corrosion entirely nor evaporates the mercury on contact—those phenomena are not typically consequences of overtrituration. Hence, option (B) correctly points to the effect of prolonged mixing, which impairs the amalgam's final mechanical integrity.

61. (A) A combination of resin matrix and silica-based filler particles

Composite resin restorations consist of an organic resin matrix (commonly bis-GMA or UDMA) integrated with inorganic filler particles (such as silica, quartz, or glass) to improve strength and wear resistance. A photoinitiator, typically camphorquinone, triggers polymerization under visible light. This sets composite apart from water-based cements like glass ionomer, which release fluoride, and from metallic alloys like amalgam. Calcium hydroxide is a liner for pulp protection, not a main constituent of composite. The resin-filler synergy is what provides composite resins with improved mechanical properties, aesthetics, and applicability in both anterior and posterior restorations.

62. (C) Camphorquinone

Light-cured composite resins typically rely on camphorquinone as the primary photoinitiator. When exposed to blue light (approximately 460–480 nm), camphorquinone interacts with a co-initiator (often a tertiary amine) to generate free radicals. These free radicals then polymerize the resin monomers (e.g., bis-GMA, UDMA), transforming the material from a pliable paste into a solid

restoration. Benzoyl peroxide is used in chemically-cured systems, not typical light-cure composites. Hydroquinone is a stabilizer inhibiting premature polymerization, whereas the amine primarily assists the photoinitiator. Thus, camphorquinone is the main catalyst under blue light exposure.

63. (C) To reduce polymerization shrinkage and improve curing depth

Composite resin undergoes volumetric shrinkage when it polymerizes, potentially creating stress at the tooth-restoration interface. Placing and curing it in smaller increments — typically no more than 2 mm thick — ensures more thorough light penetration and reduces shrinkage stress by limiting the volume polymerized at once. By layering, each increment can fully cure before the next is added, mitigating gap formation and marginal leakage. Water absorption is not a goal of the process, and this incremental approach is different from amalgam condensation. Hence, option (C) describes the fundamental rationale.

64. (C) Simple one-step placement in very deep cavities

Composite resins provide excellent esthetics, allowing shade matching with natural teeth, and they bond chemically to enamel and dentin (when used with proper bonding agents), permitting more conservative preparations. However, one-step placement in deep cavities can be problematic due to limited light penetration and excessive shrinkage stress. Deep cavities often require multiple increments plus a base or liner to protect the pulp. Therefore, the claim that composites are simple to place in a single step for deep lesions is the exception among otherwise true advantages of composite materials.

65. (C) Self-etch systems combine etching and priming in one step

Self-etch adhesives contain acidic monomers that simultaneously demineralize and infiltrate enamel and dentin, simplifying the steps by combining etchant and primer. Total-etch systems typically use phosphoric acid to etch both enamel and dentin, followed by rinsing, priming, and bonding — often generating strong bonds, especially on enamel. Self-etch approaches can achieve good dentin bonding but may be less aggressive on enamel. Total-etch certainly can bond to dentin when the technique is executed properly. Thus, the defining difference is that self-etch systems merge etch and prime steps.

66. (B) Inadequate moisture control leading to microleakage

Marginal discoloration around composite restorations is frequently attributed to microleakage. One common culprit is saliva or blood contamination during bonding, which compromises the resin's seal to enamel or dentin. This can permit bacteria and staining agents to seep at the interface. The presence or absence of the smear layer is less significant once proper etching is performed, and a "high-viscosity flowable resin" is a contradiction in terms. Ensuring a clean, dry field when applying bonding agents and composite is crucial for preventing leakage and subsequent marginal discoloration.

67. (B) Using incremental layering with oblique placement

In large Class II restorations, polymerization shrinkage stress can create marginal gaps or cusp deflection. A recognized technique is to place composite in smaller increments, especially using an oblique layering pattern that bonds fewer walls at once. Each layer is thoroughly cured before adding the next. Bulk-filling in a single pass leads to higher shrinkage stress, while omitting bonding agent defeats the purpose of composite's adhesive potential. Under-curing is not recommended, as it leads to under-polymerized composite with inferior properties. Hence, incremental oblique layering is the best strategy.

68. (B) Contamination during placement causing microleakage

Composite resins have lower thermal conductivity compared to metals like amalgam, so they generally transmit temperature changes less aggressively. Immediate cold sensitivity commonly indicates microleakage, usually from contamination (e.g., saliva or blood) at the adhesive interface. This contamination compromises the seal and allows fluid movement within dentinal tubules, triggering sensitivity. While incomplete finishing might affect smoothness or aesthetics, it is less likely to cause sharp thermal sensitivity. Proper curing of the bonding agent reduces sensitivity by strengthening

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adhesion. Thus, (B) best explains why a composite restoration might exhibit cold sensitivity right away.

69. (A) Placing a matrix band and wedge to achieve proper contact

Ensuring tight interproximal contact is a priority in posterior composite restorations. A properly placed matrix band and wedge create the necessary shape for contouring the composite and reproducing the natural proximal contact point. Undercuts in dentin are not mandatory thanks to bonding, and eugenol-based liners can inhibit polymerization of resin materials. Omitting etching steps on enamel is contrary to standard practice because phosphoric acid etching greatly enhances enamel bond strength. Hence, establishing the correct contact with a well-seated matrix band and wedge is essential in posterior composite protocols.

70. (C) Remove and replace the restoration to establish correct contact

When a proximal contact is inadequate or open, food impaction and subsequent periodontal issues can arise, requiring correction for long-term success. Simply adding flowable or burnishing does not effectively recreate a stable contact, as the shape and adaptation to the neighboring tooth must be precise. Polishing alone cannot fix a contact issue caused by poor adaptation. The reliable solution is to remove at least the proximal portion of the restoration and re-establish a proper contact using a correct matrix system and wedge. This ensures the interproximal seal and contact are functionally correct.

71. (C) Persistent sensitivity only with heavy biting forces

Postoperative pain limited to biting or chewing pressure often signifies an occlusal discrepancy (high spot) rather than pulpitis. When the restoration sits slightly proud, it receives excessive force, causing sharp or lingering pain upon closure. In pulpitis, the tooth typically exhibits prolonged thermal sensitivity or spontaneous pain that is not specifically triggered only by heavy biting. Radiographic periapical changes or systemic signs like fever or lymphadenopathy are more consistent with an advanced pulpal or periapical pathology. Thus, (C) is the red flag that typically alerts clinicians to check occlusion first.

72. (C) Saliva contamination

Achieving a secure bond in posterior teeth demands meticulous isolation, as even trace amounts of saliva can compromise the adhesive interface. Once bonding sites are contaminated, the resin's ability to penetrate etched dentin or enamel diminishes drastically, leading to marginal gaps and future caries. While overdrying and acid concentration issues can also weaken the bond, saliva or blood contamination remains a prime culprit in posterior composite failures. Proper rubber dam usage or alternative isolation ensures a dry field during adhesive steps, significantly improving composite longevity and reducing recurrent decay risk.

73. (C) Assertion is true, but Reason is false.

Dentists often place a thin layer of flowable composite as an internal liner under posterior restorations to help adapt closely to cavity floors and possibly reduce microleakage. Flowable composites typically have a lower filler content, making them more elastic or flexible than heavily filled composites. This slight elasticity can help absorb stress at the bonded interface. Thus, while the assertion about using flowable composites as liners is true, stating they exhibit low elasticity is inaccurate in this context; rather, flowables are more flexible than conventional composites, which is why they can help in stress distribution.

74. (C) A water-based cement that chemically bonds to tooth and releases fluoride

Glass ionomer cements combine a fluoroaluminosilicate glass powder with an aqueous polyacrylic acid solution. They set via an acid-base reaction and chemically adhere to enamel and dentin. A hallmark of GIC is its capacity to release fluoride, potentially inhibiting secondary caries. Metal-based amalgam is set through amalgamation, while resin-based systems rely on polymerization without significant fluoride release. Porcelain restorations are indirect and require firing at high temperatures. Therefore, option (C) accurately describes a GIC's water-based chemistry, ability to bond chemically to tooth structure, and fluoride release characteristics.

75. (B) Ability to release fluoride

One of the key benefits of glass ionomer cement is its capacity to release fluoride over time, which can help remineralize adjacent tooth surfaces and reduce caries activity. While conventional GICs bond chemically to the tooth, their bond strength to enamel is generally less than that achieved with properly etched and bonded resin materials. Compressive strength, although adequate for certain restorations, is not superior to amalgam or resin composites. Conventional GICs also do not set through light activation; they rely on an acid-base reaction. Hence, fluoride release is what makes them particularly advantageous in high-caries-risk patients.

76. (B) It has improved mechanical strength due to resin polymerization

RMGIC incorporates a light-cure resin component into the traditional glass ionomer formula. This hybridization enhances mechanical properties, speeds up the initial set, and still provides fluoride release. Resin modification addresses conventional GIC's lower fracture toughness and susceptibility to early moisture contamination. RMGIC still requires moisture control during placement, and it is light-cured to initiate the polymerization phase. Unlike pure composites, RMGIC retains an acid-base reaction and, therefore, offers beneficial fluoride release. Consequently, its higher strength and quicker set compared to conventional GIC make it more suitable in areas subject to greater stress.

77. (C) Class I in heavy occlusal load areas in adults

Glass ionomer cements excel in non-load-bearing or low-load-bearing areas, such as Class V cervical lesions (particularly where moisture control may be challenging) and primary teeth. They are also integral to the "open" or "closed" sandwich technique, enhancing bonding and fluoride release beneath composite restorations. However, because conventional GICs have lower strength and wear resistance than composites or amalgam, using them alone in Class I cavities under heavy occlusal stress is generally contraindicated. That makes option (C) the exception among otherwise suitable indications for GIC.

78. (B) GIC typically has lower compressive strength but offers fluoride release

Glass ionomer has an acid-base setting reaction and bonds chemically to tooth structure but generally exhibits lower compressive strength and wear resistance than composite resin. However, it releases fluoride, providing a cariostatic benefit. Composite's bond to the tooth typically requires an adhesive system rather than a direct chemical bond without any agent. GIC is also more forgiving of slight moisture, though not impervious to contamination, whereas composite requires stricter dryness during bonding and curing. Thus, statement (B) accurately contrasts these materials' mechanical and cariostatic properties, distinguishing GIC from composite resin.

79. (C) Glass ionomer cement

Glass ionomer cements chemically bond to tooth structure and are less sensitive to moisture than composite resins, making them especially advantageous for restoring cervical lesions below the gum line or on root surfaces. Additionally, they release fluoride, potentially reducing secondary caries. Amalgam doesn't bond chemically to the tooth and is less esthetic at cervical sites. Ceramic inlays require meticulous dryness and an indirect technique. Direct gold foil is technique-sensitive and doesn't release fluoride. Consequently, GIC's chemical adhesion and fluoride release make it the prime choice for such situations.

80. (B) Bonding glass ionomer to the tooth and covering it with composite

In the sandwich technique (either open or closed), the glass ionomer (or resin-modified GIC) is placed against the prepared tooth structure, taking advantage of chemical adhesion and fluoride release. The composite is then layered over it to provide superior aesthetics, surface hardness, and resistance to wear. This approach marries GIC's protective properties with composite's strength and polishability. Placing composite on the deepest floor is not standard, and using flowable resin with amalgam is not a sandwich technique. While the GIC and composite are placed sequentially, they are typically cured separately for best results.

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81. (C) An indirect restoration fitting within the confines of the cusps

An inlay is an indirect restoration fabricated in a dental lab or via digital workflow. It's designed to sit in the prepared cavity of a tooth, typically involving the occlusal and possibly proximal surfaces, but not covering any tooth cusp. By contrast, an onlay extends over one or more cusps, providing coverage and reinforcement. Inlays, therefore, restore internal tooth structure but remain entirely within the cusp tips. They are placed using cement or adhesive, offering excellent contour and contact. This differentiates them from direct fillings, pins, or cusp-covering onlays.

82. (B) Porcelain or ceramic

Modern inlays can be made from various materials, including porcelain, ceramic, or composite blocks, and sometimes cast metal alloys. Porcelain or ceramic inlays are known for excellent esthetics and good strength. In contrast, glass ionomer and zinc oxide eugenol are not typically used in a laboratory-processed manner for definitive inlays. Polycarboxylate cement is a water-based cement, not a final inlay material. Porcelain inlays are fabricated indirectly (in a lab or with CAD/CAM) and then cemented or bonded into place, offering precise contours, refined marginal integrity, and a natural appearance.

83. (B) Inlays can offer superior control of contours and contacts

For extensive MOD (mesial-occlusal-distal) restorations, indirect inlays can provide highly accurate contours, contacts, and occlusal anatomy. Fabrication outside the mouth allows meticulous control over shaping, ensuring a precise fit that may be difficult to achieve directly with composite, especially in challenging proximal contact areas. While inlays can be more expensive and do require tooth preparation, their lab-based customization can yield excellent marginal integrity. Composites do bond to enamel when using proper adhesive techniques. Thus, the main advantage is the superior control of form and fit that inlays can deliver.

84. (C) No need for a temporary restoration

Inlays usually require at least two visits. After the tooth is prepared and an impression (or digital scan) is taken, a temporary restoration is placed while the lab fabricates the final inlay. Precise control over proximal contacts, occlusal morphology, and polymerization shrinkage occur outside the mouth, so once bonded or cemented, the inlay adaptation can be excellent. Because of that laboratory fabrication process, the clinician typically must place a temporary. Therefore, stating there is "no need for a temporary restoration" is incorrect and is the exception among the listed advantages.

85. (B) The extent of cuspal coverage

Both inlays and onlays are indirect restorations often crafted from ceramic, composite, or metal. The key difference lies in how extensively they cover the tooth's cusps. An inlay sits within the confines of the cusps, while an onlay extends over one or more cusps, effectively reinforcing weakened tooth structure. Both require tooth preparation and are placed indirectly. Composition and shade-matching can be identical between the two, as can laboratory or CAD/CAM fabrication techniques. Thus, the distinct separation is that onlays include at least partial cuspal coverage, whereas inlays do not.

86. (C) Onlay

When a cusp is compromised, an onlay can be designed to cover and protect it without reducing the entire tooth for a full crown. This restoration lies between a smaller inlay (confined within cusp tips) and a complete crown. Class I composite might not provide adequate reinforcement for a fractured cusp. Although a full coverage crown is an option, it requires significantly more tooth reduction, which is less conservative. Hence, an onlay offers an ideal balance of coverage and preservation, meeting the need for protecting a single fractured cusp.

87. (C) Extent of tooth structure remaining to retain partial coverage

Onlays are favored when enough healthy tooth structure remains to support a partial coverage restoration. If significant tooth structure is lost, a full crown may offer better retention and resistance form. The choice is not solely about material preference, cost, or how quickly a lab can fabricate. Onlays are a conservative alternative to crowns, preserving more natural tooth but still covering compromised cusps. Patient preference for gold or

aesthetic reasons may play a role, but the deciding factor remains the tooth's structural integrity to maintain partial coverage reliably.

88. (C) Discomfort only when the patient fully occludes

Occlusal high spots commonly manifest as pain or discomfort upon biting, especially at the point of maximum intercuspation. If the onlay is slightly higher than adjacent occlusal planes, excessive force concentrates on that tooth, triggering pain. Radiographic open margins typically lead to sensitivity or potential recurrent decay, not immediate biting pain. Prolonged, spontaneous throbbing more often points to pulpitis or irreversible inflammation, which would not present exclusively during occlusion. Hence, if the discomfort arises only when biting fully, an occlusal discrepancy on the newly placed onlay is a prime suspect.

89. (A) Visible gap at the interface on close inspection

When sweet or cold sensitivity occurs soon after inlay placement, it often suggests microleakage or an inadequate seal at the margins. If a slight gap or dark line can be seen at the interface upon close inspection, that strongly suggests the inlay has not sealed properly, allowing fluids and debris to penetrate. Subgingival margins complicate visibility but don't necessarily indicate leakage. A sudden, severe throbbing might indicate pulpitis, not simply marginal leakage. Biting pressure sensitivity often points to occlusal issues, whereas sweet and cold sensitivity aligns more with marginal seal defects.

90. (B) Etching the ceramic surface with hydrofluoric acid and applying silane

Most glass-based ceramics (e.g., lithium disilicate) require surface treatment with hydrofluoric acid to create micro-porosities, followed by a silane coupling agent that promotes adhesion between the ceramic and resin cement. This step ensures a robust bond for improved retention and marginal adaptation. Eugenol-based temporary cements can inhibit resin bonding if not fully cleaned off, and permanently sealing with polycarboxylate prior to onlay placement is neither standard nor practical for final bonding. Petroleum jelly does not replace the bonding agent. Hence, hydrofluoric acid etching plus silanation is the essential protocol for ceramic onlays.

91. (B) Localized repair using a flowable composite or resin cement

Modern adhesive protocols allow conservative repairs to marginal defects if the restoration is largely sound. By carefully etching and bonding the marginal area, a dentist can seal the gap with flowable composite or a compatible resin cement. This avoids subjecting the tooth to the trauma of complete restoration replacement or an unnecessary extraction. An amalgam overlay isn't indicated for repairing a localized gap on a ceramic or composite onlay. Therefore, localized repair is the minimally invasive approach when isolation is feasible, prolonging restoration life and preserving tooth structure.

92. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Ceramic onlays are produced in a controlled environment—either a dental lab or a CAD/CAM system—enabling meticulous creation of occlusal anatomy. This controlled fabrication usually surpasses the precision achievable with freehand layering and carving of composite in a wet, clinical setting. Since the onlay is finalized outside the mouth, technicians or computerized milling can refine contours, contact points, and occlusal grooves accurately. Thus, the onlay often boasts superior anatomic replication and minimal adjustments. The Reason directly explains why the onlay can yield better morphology, making both statements true with a correct causal relationship.

93. (C) Resin cement

Resin cements are formulated to bond chemically to etched ceramic surfaces, especially when combined with silane coupling agents that enhance retention and seal. Lithium disilicate onlays rely on strong resin bonding for optimal fracture resistance and marginal adaptation. Zinc phosphate and glass ionomer cements primarily provide mechanical retention rather than chemical bonding to the ceramic, reducing the overall retention and possibly risking debonding. Zinc oxide eugenol cements are interim materials and compromise resin bonding. Therefore, a resin cement, used in tandem with the hydrofluoric acid-etch and silane protocol, is the gold-standard approach.

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94. (B) An indirect restoration that replaces the occlusal surface and includes one or more cusps

Onlays are indirect restorations designed to cover the entire occlusal surface of a posterior tooth and typically extend over at least one cusp, offering structural support. This differs from inlays, which fit between the cusp tips without covering them, or full crowns that encompass the entire tooth. Pin-retained amalgams and direct flowable composites are separate treatment modalities unrelated to cusp coverage in an indirect manner. The advantage of an onlay is that it spares tooth structure compared to a crown, while providing more coverage and reinforcement than an inlay.

95. (B) Taking an impression or digital scan of the prepared tooth

Indirect restorations like onlays follow a systematic workflow: first, the dentist prepares the tooth and captures the tooth form (traditionally by impression or via digital scanning). The lab then fabricates the restoration according to that recorded shape. Once the onlay is ready, the dentist fits it, checks the proximal contact with floss and occlusion, and finally cements it. Polishing the occlusal surface often follows final cementation or at least is confirmed intraorally. Hence, the first critical step after preparation is obtaining an accurate copy—impression or scan—of the tooth.

96. (C) They offer superior flexural strength for stress-bearing areas

Lithium disilicate ceramics provide significantly higher flexural strength than traditional feldspathic porcelain, making them more suitable for onlays and other posterior restorations subjected to occlusal forces. Feldspathic porcelain, while esthetically pleasing, can be more brittle and prone to chipping under heavy load. Lithium disilicate can be both pressed and milled using CAD/CAM, bonding effectively with resin cements. They do not eliminate the need for bonding protocols; in fact, a proper adhesive approach is essential to maximize longevity and reduce fracture risk. Thus, their standout feature is robust strength under load.

97. (D) They are always cheaper and faster than direct composite fillings

Onlays are typically more time-intensive and often more expensive than direct composite fillings. They involve lab or digital fabrication, temporary restorations, and a second appointment for placement. Their benefits include enhanced strength, refined occlusal anatomy, and cuspal coverage, but these advantages come with additional cost and complexity. Onlays are indeed indirect restorations and usually require bonding or cementation. They are particularly indicated when several cusps need coverage yet a full crown can be avoided. Consequently, claiming they are always cheaper and faster is incorrect, making (D) the exception.

98. (C) Detailed impression and stable provisional

For an indirectly fabricated inlay, the lab's ability to produce a precise restoration depends on an accurate record of the preparation, which comes from a highly detailed impression or digital scan. Additionally, maintaining a stable provisional helps prevent tooth movement or gingival overgrowth during the interim. If the tooth shifts or the preparation margin is compromised, even the most carefully crafted inlay will not fit properly at delivery. While occlusal clearance is indeed critical, an arbitrary 4–5 mm is excessive for most inlays. Retentive grooves aren't typically emphasized for bonded inlays. Hence, (C) is paramount.

99. (B) Possible microleakage or external staining at the interface

Marginal discoloration near an inlay often suggests either microleakage or surface staining at the cement line. It does not necessarily prove recurrent caries if there's no radiographic or clinical indication of decay. Over time, pigments from the oral environment can accumulate in marginal gaps or surface irregularities, creating a dark line. While an excellent seal can minimize discoloration, minor gaps or deteriorations in the resin cement interface can permit external staining. Extraction is unwarranted unless the tooth is otherwise compromised. Thus, the scenario most likely reflects microleakage or superficial staining.

100. (A) Attempt an additive resin contact repair if feasible

An open contact poses a risk for food impaction and gingival irritation, yet if the restoration and tooth are otherwise stable, a conservative repair can be attempted. This may involve lightly preparing the proximal surface, placing a matrix to shape the new contact, and bonding a flowable or packable resin. Pulpectomy (root canal therapy) is irrelevant for a contact issue, and immediately replacing the entire onlay might be unnecessarily invasive. Doing nothing can lead to chronic periodontal problems. Thus, the recommended approach is a localized, additive resin repair if conditions allow.

101. (C) Partial or complete removal of the coronal pulp with preservation of radicular pulp vitality

In a pulpotomy, the coronal portion of the pulp (often inflamed or infected) is removed, while the healthy radicular pulp is left intact to maintain vitality. A medicament is then placed on the radicular pulp stumps to foster healing and sustain the tooth's sensory and defensive mechanisms. This contrasts with a pulpectomy, where the entire coronal and radicular pulp is removed. Apex resection (apicoectomy) and extraction are different surgical procedures altogether. By retaining vital radicular pulp, pulpotomy can be an effective, conservative approach—especially in pediatric or select adult cases if conditions allow.

102. (B) Mineral trioxide aggregate (MTA)

Mineral trioxide aggregate is commonly regarded as the gold-standard pulpotomy agent because of its biocompatibility and ability to stimulate hard tissue formation. It provides a good seal against microbial infiltration and promotes the formation of a dentinal bridge. Zinc oxide eugenol was once used, but it lacks the regenerative stimulation MTA offers. Amalgam is a restorative material, not a pulp-capping or pulpotomy agent, and gutta-percha is used primarily in root canal obturation after pulp removal. Hence, MTA stands out for enhancing radicular pulp vitality and facilitating a successful pulpotomy outcome.

103. (C) To retain healthy radicular pulp function and avoid full root canal therapy

A pulpotomy seeks to eliminate inflamed coronal pulp tissue while preserving the vitality of the remaining radicular pulp. In cases of reversible pulpitis or select traumatic exposures, the radicular portion may still be healthy. By conserving it, the tooth maintains its sensory and immune defense systems, especially beneficial for continued root development in younger patients. Full instrumentation and obturation (i.e., root canal treatment) are not performed unless the radicular pulp is non-vital or irreversibly inflamed. Extraction is only a last resort when the tooth cannot be saved. Thus, pulpotomy helps avoid more extensive endodontic intervention.

104. (C) Irreversible pulpitis extending into the radicular pulp

A pulpotomy relies on the premise that the radicular pulp remains healthy or only minimally inflamed. In irreversible pulpitis, inflammation has spread throughout the pulp system, rendering the radicular portion nonviable. Pulpotomy would likely fail because disease extends beyond the coronal pulp. Conversely, traumatic pulp exposure, deep caries with reversible symptoms, and stable radicular pulp with minor bleeding are situations where pulpotomy can succeed if the tooth structure supports it. Thus, (C) is excluded since advanced pulpitis typically requires a full pulpectomy and root canal treatment rather than a partial coronal pulp removal.

105. (B) Pulpectomy removes the entire pulp, both coronal and radicular

A pulpotomy aims to remove just the coronal pulp while leaving a healthy or minimally inflamed radicular pulp intact. In contrast, a pulpectomy (often synonymous with the beginning stages of root canal therapy) involves complete removal of all pulp tissue—coronal and radicular—to manage irreversible pulpitis or necrosis. While either procedure can be completed in one or multiple visits depending on clinical circumstances, the key difference lies in how much pulp tissue is removed and whether the tooth's vital function is maintained. Thus, (B) correctly highlights that pulpectomy entails total pulp extirpation.

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106. (D) Pulpectomy and apexification or revascularization procedure

A necrotic pulp in a tooth with open apices complicates standard root canal obturation due to the wide, thin-walled canal and lack of an apical stop. Pulpectomy is essential first to remove necrotic tissue. Then apexification (traditional approach using calcium hydroxide or MTA to induce apical barrier formation) or revascularization (a regenerative endodontic procedure) can be employed to stimulate continued root development. Conventional RCT obturation is challenging without a formed apex. Extraction and implant placement in a growing individual is premature. Hence, apexification or revascularization is the recommended approach for such cases.

107. (B) Pulpotomy with a suitable medicament like MTA

In a 10-year-old with open apices, preserving vitality is crucial to allow continued root elongation and apex closure. A pulpotomy removes only the diseased coronal pulp, maintaining healthy radicular pulp for ongoing development. MTA (or similar biocompatible materials) can facilitate healing and form a protective barrier. A full pulpectomy with immediate gutta-percha obturation might halt root formation, leaving a weak root with open apex. Extraction should be a last resort, and apicoectomy (root-end surgery) is not indicated in a tooth with open apices and vital radicular pulp. Hence, option (B) is ideal.

108. (B) Convert to a full pulpectomy (root canal therapy)

Profuse or uncontrolled bleeding suggests the radicular pulp is significantly inflamed or irreversibly damaged, making a partial pulpal procedure (pulpotomy) unsuitable. In successful pulpotomies, bleeding usually stops or is easily controlled within minutes after coronal pulp amputation. Persistent hemorrhage likely indicates that the tissue beyond the coronal portion is unhealthy. Accordingly, the recommended course is to remove the remainder of the pulp (pulpectomy) and proceed with root canal therapy. Merely placing a medicament or glass ionomer over vigorously bleeding tissue jeopardizes the outcome, as the radicular pulp is likely beyond reparative capacity.

109. (B) Achieving a tight coronal seal to prevent contamination

In apexification cases, calcium hydroxide is placed into the canal to induce the formation of an apical barrier or encourage some apex closure in a necrotic tooth. During this extended treatment, a tight coronal seal is critical because bacterial infiltration would undermine the entire regenerative or apexification process. Composites or glass ionomer often serve as temporary restorations to keep the canal environment sterile. Radiographic follow-ups are essential to track barrier formation. Leaving the orifice unfilled or skipping follow-up invites failure. Thus, (B) captures the most pivotal action in apexification management.

110. (D) Obturation with gutta-percha at the first appointment despite the open apex

Apexification aims to create a suitable apical barrier in a tooth with an open apex before final obturation. Placing gutta-percha immediately in a wide-open apex typically leads to inadequate apical seal and potential failure. Instead, necrotic tissue is thoroughly removed, and calcium hydroxide or MTA is placed to encourage apex closure or produce an artificial barrier. The tooth is then sealed temporarily to prevent contamination. Once the apex demonstrates a barrier (radiographically or clinically), a definitive obturation with gutta-percha can proceed. Hence, option (D) is incorrect in a standard apexification protocol.

111. (D) Arrested root development and possible periapical pathology

A necrotic pulp in a developing tooth can no longer supply nutrients or promote continued dentinal deposition. As a result, root development halts prematurely, leading to thin walls and a blunderbuss apex. Additionally, infection from the necrotic pulp can spread periapically, resulting in pathology such as abscesses or granulomas. Without intervention, the tooth is at higher risk of fracture, further infection, and eventual tooth loss. Options suggesting normal development or spontaneous resolution are unrealistic given the necrotic state. Hence, (D) correctly depicts the likely consequence of an untreated necrotic pulp in a young tooth.

112. (C) Radiographic evidence of a large periapical radiolucency

A large periapical radiolucency often signals that the infection has spread beyond the coronal pulp, indicating potential necrosis or extensive radicular pulp pathology. Such a finding undermines the premise of a pulpotomy, which relies on healthy radicular tissue. Mild sensitivity or minor bleeding can be consistent with reversible coronal pulpitis, which is still manageable via pulpotomy if radicular health is confirmed. Vitality on testing further supports a salvageable radicular pulp. Conversely, a visible radiolucency typically signifies advanced disease or necrosis, necessitating a full pulpectomy or other endodontic procedures rather than a simple pulpotomy.

113. (C) Assertion is true, but Reason is false.

Apexification is indeed indicated in immature permanent teeth with necrotic pulp, as it aims to form an apical barrier or create conditions for root-end closure so obturation is feasible. However, it does not restore normal pulp function or lead to continued root elongation in a necrotic tooth. Instead, apexification helps "close" the apex artificially or encourage a hard tissue barrier so gutta-percha can be placed. True continued root development and pulp function require vital pulp therapy or revascularization. Therefore, the Assertion is correct about when apexification is performed, but the Reason is not.

114. (A) Pulpotomy

In a primary molar with an accidental coronal pulp exposure, and with the radicular pulp appearing healthy, a pulpotomy is often the treatment of choice. This approach entails removing the coronal portion of the pulp and applying a suitable medicament (such as MTA or ferric sulfate) to preserve vitality of the remaining radicular pulp. Direct pulp capping in primary teeth has lower success rates when compared to pulpotomy. Pulpectomy might be considered if the radicular pulp was infected or non-vital. Extraction is unnecessary if the tooth is restorable and radicular pulp remains healthy.

115. (B) To allow root walls to thicken and continue normal development

Revascularization is a regenerative endodontic protocol that encourages bleeding into the disinfected canal, forming a blood clot scaffold. Stem cells from the periapical area can potentially re-establish vascular supply, promoting further root development. Unlike apexification, which mainly produces an apical stop without continued root elongation or thickening, revascularization can help the tooth develop thicker dentinal walls and a more physiologic apex. Standard apexification halts additional root formation, leaving the tooth structurally weaker. Although instrumentation is carefully controlled in revascularization, it's not entirely avoided, and early gutta-percha placement is not desired.

116. (C) Calcium hydroxide or MTA

Traditional apexification involves placing calcium hydroxide for multiple months to induce a calcified barrier at the root apex in an immature tooth. Mineral trioxide aggregate is an alternative, often placed apically in a one- or two-visit method to seal off the apex. Both materials can promote apical closure or create a barrier, facilitating subsequent obturation with gutta-percha. Glass ionomer and composite resin are restoratives, not apexification agents, and zinc oxide eugenol is generally used as a sedative filling or root canal sealer in certain contexts, but not specifically for apexification.

117. (B) Formation of thicker dentinal walls and further root development

In a necrotic tooth with an open apex, classic apexification can provide a barrier but does not encourage continued root development. Revascularization, however, aims to reintroduce vital tissue into the canal by creating a blood clot scaffold and sealing the tooth, giving stem cells a chance to form new hard tissue. This can strengthen the root walls and continue apex closure, offering superior long-term integrity. While gutta-percha is eventually placed if revascularization fails or partial development halts, the immediate goal is biologic regeneration. Irrigation remains essential for disinfection, and a single-step approach is uncommon. Thus, thicker dentinal walls are the key benefit.

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118. (B) Removing diseased or necrotic pulp tissue, disinfecting canals, and obturating them

Root canal therapy is a systematic procedure wherein necrotic or inflamed pulp tissue is removed to eliminate infection or prevent its spread. The canals are thoroughly cleaned, shaped, and disinfected—usually with chemical irrigants and mechanical instrumentation—before being obturated (sealed) with materials like gutta-percha and sealer. This process aims to prevent reinfection and preserve the natural tooth structure. Placing direct restorations in the crown or leaving the coronal portion sealed without addressing the canals fails to address pulp pathology. Thus, (B) captures the essential definition of RCT.

119. (C) Rotary NiTi files

Rotary nickel-titanium (NiTi) files are specifically designed for mechanical instrumentation in endodontics. Their flexibility and shape memory properties allow them to navigate curved canals while maintaining the original path. K-files and Hedstrom files are typically used manually in a push-pull or filing motion, while barbed broaches are primarily for extirpation of pulp tissue. Rotary NiTi systems, operated with a low-torque motor, shape the canal efficiently and consistently. Hence, (C) pinpoints the system that uses a rotating action with NiTi alloy, a mainstay in modern root canal therapy.

120. (B) It dissolves vital and necrotic tissue while disinfecting

Sodium hypochlorite (NaOCl) is an effective root canal irrigant due to its capacity to break down organic tissue (both vital and necrotic) and its broad-spectrum antimicrobial properties. By dissolving pulp remnants and biofilm, it greatly reduces microbial load within the canal system. Although additional agents like EDTA may be needed to remove the smear layer and for final rinsing, NaOCl remains the primary irrigant throughout instrumentation. It is not merely a lubricant, and it serves a central role in disinfection, not just a final flush. Thus, option (B) reflects its essential functionality.

121. (C) Aggressively removing healthy periapical tissue

Canal shaping aims to gently enlarge and taper the root canal space while preserving its original anatomy, ensuring thorough debridement and facilitating obturation. Important goals include removing necrotic pulp debris and leaving a smooth path that can be sealed effectively. Over-instrumentation beyond the apical foramen into healthy periapical tissue is undesirable, risking extruded irrigants, prolonged healing times, and potential complications. Therefore, (C) is contrary to the principles of endodontic shaping. Conserving tooth structure and respecting the apical anatomy are fundamental tenets of modern root canal therapy.

122. (C) Lateral condensation involves placing a master cone and spreading with accessory cones

In lateral condensation (the classical technique), a standardized master cone is fitted to working length, and then a spreader is used to create space for accessory cones, incrementally sealing the canal. Warm vertical condensation, by contrast, employs a heated plugger to soften and condense gutta-percha apically, followed by incremental backfilling. Both methods require a sealer to fill voids and enhance sealing. Lateral condensation does not rely on heat, and warm vertical condensation does not typically use accessory cones in the same manner. Thus, (C) accurately describes lateral condensation mechanics.

123. (B) Warm vertical condensation

Warm vertical condensation (also known as the warm vertical compaction technique) allows the gutta-percha to be softened and compacted apically and laterally for a denser fill. This helps conform the filling material closely to canal irregularities, particularly beneficial in curved canals. Cold lateral condensation, while effective, can sometimes leave small voids or less adaptation. A single-cone technique may be quick but may not achieve ideal three-dimensional obturation without additional modifications. Silver points are largely outdated due to corrosion and poor sealing over time. Hence, warm vertical condensation offers superior adaptation and density.

124. (B) Carefully determining working length to avoid overextension

An accurate working length is pivotal for a successful endodontic outcome. Overfilling can extrude material beyond the apex, irritating periapical tissues, while underfilling leaves unsealed space where bacteria can thrive. Proper measurement, often verified with electronic apex locators and radiographs, helps ensure that the gutta-percha and sealer are confined within the canal. A sealer is necessary to fill microspaces between gutta-percha and canal walls, whereas leaving a void at the apex compromises the seal. Thus, respecting the correct working length is central to obtaining a tight, successful apical seal.

125. (C) Persistent, dull throbbing in the periapical area

Overextension of gutta-percha or sealer beyond the apex can irritate periapical tissues, leading to lingering or dull throbbing pain. Because the extruded material can incite an inflammatory response, patients commonly experience lingering pain, tenderness to palpation, or throbbing sensations. Sharp pain that quickly subsides under cold testing is more indicative of reversible pulpitis—irrelevant in a tooth that has already undergone RCT. A mild pressure sensitivity might be present in normal healing but is less specific. A clicking sensation typically suggests a different mechanical issue. Hence, (C) aligns with periapical irritation from overfill.

126. (B) Thorough chemo-mechanical debridement and intracanal medicament if needed

Post-operative flare-ups often arise from residual infection or debris within the canal. Adhering to meticulous chemo-mechanical debridement—using irrigants like sodium hypochlorite and shaping instruments—substantially lowers the bacterial load. In cases with persistent drainage or an abscess, placing an intracanal medicament (e.g., calcium hydroxide) between appointments can further reduce microbes. Purposefully overextending files or ignoring irrigation contravenes best practices, risking extruded debris or incomplete disinfection. Leaving canals unmedicated when infection is present also heightens the risk of flare-ups. Hence, thorough cleaning and, if indicated, an appropriate medicament are critical steps per current standards.

127. (C) Build up the tooth with a suitable restorative material (core buildup) for proper isolation

Adequate isolation is paramount during endodontic procedures to prevent saliva contamination and ensure a sterile environment. When tooth structure is severely compromised, placing a core buildup (e.g., with glass ionomer or composite) prior to final instrumentation and obturation helps achieve a stable tooth form suitable for rubber dam placement. Extraction is unwarranted if the tooth can be restored. A post and core typically follow after obturation if needed, not beforehand. Skipping a rubber dam for minimal tooth structure is contraindicated as it jeopardizes the aseptic approach fundamental to successful RCT.

128. (D) Leaving necrotic debris in the canal for a second appointment

Single-visit endodontics hinges on completely debriding and disinfecting the canal system in one session. If the canal is properly cleaned, shaped, and the patient is asymptomatic, obturation can be completed immediately, followed by a final or interim restoration. Leaving necrotic debris behind is counterproductive, as it perpetuates infection and undermines therapy success. While multi-visit treatment with intracanal medication is sometimes warranted for extensive infection or exudate, in a single-visit approach, thorough removal of necrotic tissue is mandatory. Therefore, (D) is incorrect for single-visit protocols aiming to finalize treatment promptly.

129. (C) Potential extrusion of debris and irritants

Over-instrumentation can push infected debris, irrigants, or filling materials past the apical foramen into periapical tissues, provoking inflammation and postoperative discomfort or complications. Proper working length is determined to avoid iatrogenic trauma beyond the apex. Maintaining the original canal length ensures minimal risk of extruding material while still removing necrotic tissue effectively. Overextension neither improves the apical seal nor thickens the canal walls. Instead, it can worsen healing outcomes. Hence, pushing debris or irritants into the periapex is the most likely undesirable result of going beyond the foramen.

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130. (B) Radiographic evidence of a J-shaped or halo-like lesion around the root

A vertical root fracture often presents with a characteristic J-shaped or halo radiolucency around the affected root. Such findings differ from a typical periapical radiolucency or minor post-operative tenderness, which can be normal after endodontic procedures. Pain from a vertical fracture is often localized on biting or release, and standard analgesics may not fully resolve it if the fracture is mobile or contaminated by bacteria. While mild tenderness or biting discomfort can occur from occlusal discrepancies or standard healing, a distinct J-shaped radiolucency strongly suggests a root crack rather than simple sensitivity.

131. (C) Assertion is true, but Reason is false.

Warm vertical compaction, continuous wave, or thermoplasticized gutta-percha techniques soften the material so it can flow and adapt intimately within canal irregularities. This typically improves sealing compared to cold lateral condensation alone. The reason given, stating heating gutta-percha makes it more brittle and less flowable, is actually incorrect. Heat increases gutta-percha's plasticity, making it more moldable or flowable. Therefore, while the assertion is correct—that warm obturation aids adaptation—the reason is false because the fundamental improvement arises from greater viscosity and improved flow under heat, not increased brittleness.

132. (D) Calcium silicate-based sealer

Bioceramic sealers, often formulated with calcium silicate compounds, exhibit alkaline pH and excellent sealing properties, as well as potential bioactive behavior that can encourage periapical healing. Examples include sealers derived from MTA-like technology. These materials can form hydroxyapatite at the interface, creating a favorable environment for tissue repair. Zinc oxide eugenol-based, glass ionomer-based, and epoxy resin-based sealers have their own merits—such as adequate sealing, ease of use, or adhesive qualities—but do not inherently exhibit the same level of biocompatibility and high pH found in calcium silicate-based (bioceramic) sealers.

133. (B) Smear layer can block sealer penetration into dentinal tubules

During instrumentation, a smear layer of dentinal debris and organic matter forms on canal walls. While present, it can clog dentinal tubules, preventing the sealer from penetrating and achieving a more intimate seal. Removing this layer (commonly via EDTA) improves contact between the endodontic filling materials and the dentinal tubules, enhancing the bond and reducing microleakage pathways. Retaining the smear layer is generally considered counterproductive in modern endodontics, as it can harbor bacteria and compromise obturation. Therefore, removing it fosters better adaptation of both sealer and gutta-percha.

134. (B) Missed canal leading to persistent infection

One of the most common causes of endodontic failure is failing to locate and treat all canals within a tooth. Lower molars often have multiple mesial canals that can be difficult to visualize and instrument if the operator doesn't carefully examine radiographs or perform thorough exploration under magnification. A missed canal remains infected, leading to persistent or recurrent periapical pathology. Warm vertical obturation itself is not inherently prone to failure, and ignoring post-operative restorations also leads to different complications. Excessive coronal tooth structure is generally advantageous, not a failure cause. Hence, (B) applies here.

135. (B) A large periapical radiolucency that increased since treatment

A growing periapical radiolucency typically indicates ongoing or worsening periapical inflammation or infection. It signifies that pathogens remain or have recolonized the canal system, leading to failure of endodontic therapy. Mild temperature sensitivity or slight discoloration of the tooth may be inconclusive or unrelated to reinfection. A stable sinus tract or lack of changes on radiographs might not necessarily imply a deepening infection. The presence of pain and swelling plus an enlarging radiolucency strongly points to persistent or recurrent infection, necessitating re-treatment or further endodontic interventions.

136. (B) Retreatment often requires removal of previous filling and any obstructions

Endodontic retreatment typically involves regaining access to the canal system by removing prior filling materials such as gutta-percha, sealer, or posts. The canals are then re-cleaned, re-instrumented, and re-obturated if persistent infection or technical errors are found. Irrigants are still employed to disinfect the canals. Non-surgical retreatment is often attempted first before surgical endodontics (apical surgery) is considered. Retreatment does not skip the cleaning phase; thorough debridement remains crucial to success. Thus, removing previous fillings or obstructions is the hallmark step distinguishing retreatment from initial endodontic treatment.

137. (B) There is a significant coronal obstruction or failing restoration that can't be removed

Non-surgical retreatment is recommended when the canal system can be re-accessed and properly disinfected, giving the tooth another chance at healing. However, if a restoration, post, or obstruction cannot be removed without risking the tooth's structural integrity, or if other anatomic challenges make orthograde re-instrumentation impossible, then surgical endodontics (apicoectomy) or alternative procedures might be warranted. A homogenous condensation or mild post-obturation sensitivity do not preclude non-surgical retreatment. Patient preference can be a factor, but typically the dentist's assessment of feasibility and prognostic success guides whether to choose surgical or non-surgical re-treatment.

138. (A) Attempt to bypass or remove the fragment for proper cleaning

When a separated file obstructs access to the apical portion in an infected canal, it can harbor bacteria. The priority is either to retrieve the fragment if feasible or bypass it so the canal space can be disinfected thoroughly. Merely sealing coronally around the obstruction leaves a reservoir of untreated infection, risking persistent pathology. Placing a post and core is premature and does not address the infection. Proper cleaning and shaping beyond or around the separated file is necessary for successful retreatment. Thus, (A) ensures complete debridement and improved outcome likelihood.

139. (B) Applying a finger spreader or hand spreader incrementally

In lateral condensation, after placing a master cone, a spreader is used alongside the cone to create space for accessory cones. The spreader is systematically advanced and withdrawn, and each accessory cone is condensed laterally against the canal walls. This incremental action is crucial for eliminating voids and improving adaptation of gutta-percha. Heating the master cone is more aligned with warm vertical condensation techniques, and overfilling the canal is counterproductive. Vaseline is not a substitute for an endodontic sealer. Proper usage of spreaders, coupled with a sealer, yields a tight lateral condensation.

140. (B) Dry with paper points and place an intracanal medicament

If the canal still exhibits exudate or slight drainage, immediately obturating can trap residual infection or fluid, risking treatment failure. Instead, drying the canal with sterile paper points and placing an intracanal medicament (e.g., calcium hydroxide) helps control persistent infection and encourage healing. Enlarging the canal beyond the apex causes further tissue trauma, and leaving the tooth open is associated with reinfection and contamination. The recommended approach is to give time for exudate resolution and evaluate healing after a period with medication before final obturation.

141. (C) Forcing large files beyond the apex

Maintaining patency means keeping the canal unblocked by periodically passing a small file to the full working length, preventing dentinal debris from compacting apically. Irrigation helps flush out debris, and electronic apex locators plus radiographs confirm accurate length. However, deliberately pushing large files beyond the apex is contraindicated as it risks extruding material and damaging periapical tissues. The goal is a gentle, minimal-diameter file at working length, preserving the apical anatomy without forcing large instruments or overextending. Hence, (C) is incorrect for properly maintaining patency.

142. (B) Microbial retention in canal irregularities

Smear layer harbors bacteria and debris, and if it remains, it can shield microbes within dentinal

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tubules, jeopardizing the long-term success of root canal therapy. Thorough final irrigation—commonly with EDTA to remove the inorganic smear layer and sodium hypochlorite for disinfection—helps create a cleaner canal environment. Proper debridement promotes better sealer penetration, lowers microbial presence, and strengthens the overall seal. Insufficient irrigation doesn't typically lead to apex closure or an overextended cone. Rather, it fosters bacterial entrenchment in canal irregularities, risking eventual reinfection. Therefore, (B) is the direct consequence.

143. (C) A small, isolated radiolucency on the lateral aspect of the root

If a small radiolucency is visible along the lateral surface of the root rather than the apex, it can point to an accessory or lateral canal harboring infection. Missed or inadequately cleaned lateral canals can lead to persistent symptoms and limited healing. Normal radiographs or generalized mild soreness are less specifically indicative of a missed canal. Crown discoloration may be unrelated to residual infection. Identifying a discrete lateral radiolucency is a key clue that the main canal was sealed, but outlying areas might have been overlooked, causing the continued tenderness.

144. (C) Assertion is true, but Reason is false.

Gutta-percha is indeed the most widely used core material for obturating canals. However, it does not by itself form a perfect seal. Tiny voids and spaces can remain at the interface with canal walls. To address this, a sealer is applied alongside gutta-percha to fill minute discrepancies and enhance adaptation. The synergy of gutta-percha and sealer produces a three-dimensional seal. So while the assertion that gutta-percha is the primary filling material is correct, the notion that it alone provides an "impervious seal" is false. Hence, option (C) fits best.

145. (C) Cone-beam computed tomography (CBCT)

CBCT imaging provides three-dimensional visualization of the tooth's internal anatomy, enabling detection of additional or curved canals that might not be apparent on traditional two-dimensional radiographs. Percussion testing and electric pulp testing evaluate pulp or periapical status but offer limited insight into canal configurations. Rubber dam isolation is a clinical protocol for contamination control, not an investigative tool for internal tooth morphology. By leveraging CBCT, clinicians can better anticipate complexities, leading to more accurate canal location, shaping, and filling during endodontic treatment. Hence, (C) is the definitive answer.

146. (A) Removing old gutta-percha and irrigating the newly found canal thoroughly

A draining sinus tract often indicates persistent infection, which commonly arises if a canal was missed or inadequately treated. Once a previously uninstrumented canal is discovered, removing old filling materials and properly debriding the newly located canal are essential. Adequate irrigation with sodium hypochlorite, possibly assisted by ultrasonic agitation, removes any residual debris or bacterial biofilm. Merely sealing it without thorough cleaning leaves pathogens in place. Checking occlusion and placing a direct restoration do not address the underlying infection. Thus, the key step is re-debridement and irrigation to re-disinfect the missed canal.

147. (B) Use of ultrasonic troughing under magnification

Maxillary first molars frequently have a second mesiobuccal canal (MB2) that can be elusive. Locating it during re-treatment is paramount if it was missed previously. Ultrasonic tips are invaluable for troughing and gently removing dentin in the MB groove, especially when combined with enhanced magnification (dental loupes or a microscope). This precise approach reduces the risk of perforation or excessive tooth removal. Placing a post or skipping thorough re-treatment might ignore the real culprit. Apicoectomy alone often fails unless the missed canal is addressed. Hence, ultrasonic troughing under magnification is key to success.

148. (A) Heat application and solvents

In endodontic retreatment, removing existing gutta-percha often involves solvents (like orange oil or chloroform) that soften or dissolve the material, coupled with heat or mechanical instruments (heated pluggers, ultrasonic tips) to loosen and extract it. Using a high-speed bur within the canal is risky and can cause perforation. Direct compression with

a spreader does not facilitate retrieval. Injecting chloroform blindly to the apex is unsafe and can extrude beyond the canal. Hence, carefully applying heat and solvents is the standard technique to safely remove gutta-percha and gain access for thorough re-instrumentation.

149. (B) Detailed debridement and disinfection of the entire isthmus and canals

When a tooth shows recurrent infection after root canal therapy, residual or newly colonized bacteria are typically hidden in uninstrumented canal areas, including isthmuses, lateral canals, or missed main canals. Merely placing fresh gutta-percha will not solve the source of infection; the necrotic debris must be removed. Proper re-instrumentation, thorough irrigation (often with NaOCl and EDTA), and possible ultrasonic activation for better penetration are needed to clean the isthmus thoroughly. Extraction is only indicated if the tooth cannot be salvaged. Simply observing or placing new filling material without debridement perpetuates the infection. Thus, (B) is essential.

150. (B) Obtain final working length and obturate with gutta-percha and sealer

When drainage ceases and the canal is clean and asymptomatic, the tooth is ready for final obturation, provided it has a mature apex and no other complicating factors. Calcium hydroxide was used to control infection or exudate. Once the infection is resolved and the canal is dry, continuing to leave the tooth medicated may offer diminishing returns. Extraction isn't warranted if the tooth is salvageable. Apexification is specific to immature teeth with open apices. Therefore, confirming the working length (in case of minor changes) and completing root canal filling with gutta-percha and sealer is the appropriate next step.

151. (C) Preserving healthy tooth structure while removing only irreversibly damaged tissue

Minimally invasive dentistry focuses on conserving as much sound tooth structure as possible. The aim is to remove just the irreversibly infected or structurally compromised parts, preventing unnecessary weakening of the tooth. Large undercuts or wide outline forms were once deemed preventive, but now they can compromise the tooth's integrity. Adequate isolation remains essential for bonding and contamination control. Therefore, the key rationale is to maintain tooth longevity by sparing healthy enamel and dentin, using targeted removal of pathology followed by advanced bonding and restorative techniques to restore function and form effectively.

152. (B) It refines internal walls and creates sharp line angles

The enamel hatchet is a hand instrument designed for planing or smoothing cavity walls, particularly in the proximal box of Class II preparations. It can remove thin edges of unsupported enamel and help create well-defined line angles for proper retention form in preparations for amalgam restorations. This instrument is not intended to remove entire metallic fillings; specialized burs or ultrasonic tips might handle that. Polishing composite is achieved through finishing burs, discs, or polishing systems, not typically hatchets, and they are not used routinely for endodontic access or canal work. Thus, (B) is correct.

153. (B) To reduce stress concentration and improve resistance

A flat pulpal floor helps distribute masticatory forces more evenly across the tooth-restoration interface and reduces the likelihood of concentrated stress points that could lead to fracture. This design principle is part of the conventional approach for amalgam cavity preparation—ensuring the tooth has the structural integrity to handle compressive and shearing forces. It is not intended to create a bond reservoir or to replicate cusp inclines. Furthermore, controlling moisture infiltration is the opposite of standard technique—operators strive to maintain a dry field. Hence, (B) is the primary rationale for a flat pulpal floor.

154. (C) Enhancing mechanical retention within the box

A matrix band (often used with a retainer and wedge) is essential in Class II composite restorations to recreate natural tooth shape, prevent overhangs, and achieve a stable, tight contact point. It helps limit gingival excess, ensuring a more anatomically correct emergence profile. However, the matrix band does not aim to produce mechanical undercuts or retention forms in the proximal box;

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resin restorations rely on adhesive bonding rather than retentive undercuts. Thus, building mechanical retention is not a primary objective of correct matrix placement, making (C) the exception among these goals.

155. (C) Inlay preparations are more conservative, retaining more healthy structure

An inlay fits within the confines of the cusps, meaning less tooth reduction compared to a full crown that circumferentially covers all or most of the tooth. Full coverage requires greater occlusal and axial reduction to accommodate restorative material thickness and to create space for the margins. Thus, inlays conserve more tooth structure when a minimal portion of the tooth is lost. Full crown preparations do not inherently conserve more structure; they are indicated when multiple cusps or significant tooth volume is compromised. Therefore, (C) accurately contrasts inlays with full crowns.

156. (B) Place a liner or base over the affected dentin if it is hard and seal it

Modern caries management recognizes the difference between infected dentin, which must be removed, and affected dentin, which is partially demineralized but can remineralize if sealed. If the affected dentin is firm (i.e., not soft, leathery, or necrotic), it can be retained beneath a biocompatible liner or base to prevent pulp exposure and encourage remineralization. Aggressive removal of all stained dentin risks needless pulp trauma, and a pulpectomy is unwarranted if the pulp remains vital. Leaving the cavity open is counterproductive, inviting further bacterial colonization. Hence, (B) aligns with conservative dentistry principles.

157. (B) Presence of moisture or ability to isolate for bonding

In a posterior Class II scenario, composite restorations require a dry field for predictable bonding to tooth structure. If it is difficult or impossible to control moisture (e.g., subgingival margins or heavy bleeding), amalgam may be a more reliable choice. Although patient preference and shade selection matter, moisture contamination can lead to bond failure, postoperative sensitivity, or restoration breakdown in composite restorations. Dentists' handedness is irrelevant to the material selection itself. Thus, controlling moisture for a proper resin bond stands out as the critical factor in deciding composite versus amalgam.

158. (C) Sensitivity that diminishes within seconds and no lingering pain

Short-lived, mild sensitivity to cold is common after new restorations, especially in composites that undergo polymerization shrinkage. If the sensitivity dissipates quickly (under ~5 seconds) and has no lingering or spontaneous pain component, it usually indicates a normal post-restoration response. Lingering or throbbing discomfort often signals deeper pulp involvement or high occlusion. Radiolucency under the restoration can suggest microleakage or recurrent caries. Heightened biting pain frequently arises from a high contact or occlusal discrepancy. Hence, brief sensitivity without persistent or severe symptoms is typically a sign of a successful restoration.

159. (B) Ensuring the tooth is asymptomatic and verifying no secondary caries

In indirect pulp capping, a liner or base is applied over remaining affected dentin, hoping for remineralization and avoiding pulp exposure. Before final restoration (particularly when placing large, definitive restorations), the operator should confirm that the tooth remains symptom-free, with no signs of bacterial re-infiltration, necrosis, or persistent decay. Radiographic examination helps assess any progression of caries or pathology. Removing the liner to "re-check" the pulp is unnecessary if clinical and radiographic signs are favorable. Crowning immediately without re-evaluation risks covering up an ongoing issue. Thus, ensuring pulp vitality and no new decay is essential.

160. (C) Pulpotomy or partial caries removal with a biocompatible liner

In a young permanent tooth showing reversible symptoms, preserving pulp vitality is paramount to allow continued root development and natural defenses. A pulpotomy, if the coronal pulp is inflamed but radicular pulp is healthy, can keep the tooth vital. Alternatively, partial caries removal and protective liner placement might suffice if the pulp exposure is not significant or the radicular

pulp is not substantially affected. Full root canal treatment or extraction is unnecessarily aggressive for reversible pulpitis in a developing tooth. Simply crowning without addressing the pulp issues could lead to unresolved pathology.

161. (C) Extending each layer onto multiple cavity walls at once to reduce time

Incremental layering for composite is intended to minimize polymerization shrinkage and ensure complete cure by controlling the thickness of each layer—usually about 2 mm. Each increment is light-cured before adding the next. If a single increment flows onto multiple walls simultaneously, it can create significant shrinkage stress pulling in multiple directions at once, risking gap formation. Separating increments by walls or using oblique layering helps mitigate these stresses. Thorough curing and matrix stabilization with a wedge are correct steps. Therefore, (C) is the incorrect approach for incremental layering.

162. (C) Food impaction and plaque retention near the contact area

Overhangs, rough margins, or open contacts are common outcomes of inadequate finishing and contouring in Class II restorations. These imperfections trap food and bacterial plaque, potentially causing gingival inflammation, recurrent caries, and periodontal problems. Well-finished margins improve gingival health and facilitate easy cleansing. A precise proximal contact and correct anatomical form reduce the chance of food impaction. Poor finishing typically doesn't improve occlusal wear; it can accelerate it if the surface is rough or incorrectly contoured. Hence, (C) is the direct consequence of improper finishing and contouring.

163. (C) Pain only when the opposing tooth contacts the restoration

Pain purely on closure, when the opposing tooth contacts the restoration, typically indicates a high restoration or occlusal interference. The excessive force triggers acute discomfort each time the patient bites down. Pulpitis, particularly irreversible pulpitis, is characterized by lingering pain after thermal stimuli, possibly spontaneous episodes, and the pain can persist for more than a minute. Systemic signs like fever or swelling suggest infection extending beyond the tooth. Hence, if the pain occurs only on biting pressure, the likely culprit is an occlusal discrepancy (i.e., a high spot) needing adjustment.

164. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Modern caries theory differentiates between infected dentin, which is necrotic and irreversibly colonized by bacteria, and affected dentin, which remains structurally viable and capable of remineralization if sealed from the oral environment. In indirect pulp capping, the goal is to remove only infected dentin and leave behind the harder, partially demineralized layer. Applying a liner (e.g., calcium hydroxide, MTA, or glass ionomer) protects the pulp and prevents further microbial invasion. When it's well-sealed, the affected dentin can repair itself. Therefore, the Assertion and Reason align perfectly, making option (A) correct.

165. (B) Maintaining radicular pulp vitality to continue root development

In young permanent teeth with incomplete apex formation, pulpotomy is performed if the coronal pulp is irreversibly inflamed while the radicular pulp remains healthy. By removing the diseased coronal portion and placing a suitable medicament on the remaining pulp, clinicians preserve pulp vitality in the roots, enabling continued root development and apex closure. The ultimate aim is to ensure thickened dentinal walls and stronger tooth integrity. Full pulpectomy or creating an artificial barrier is unnecessary if the radicular pulp is still vital. Reducing crown height is unrelated to pulpal therapy objectives.

166. (B) Mineral trioxide aggregate (MTA)

MTA has gained wide acceptance for direct pulp capping due to its superior sealing ability, biocompatibility, and promotion of reparative dentin formation. It is frequently the material of choice in procedures aiming to preserve pulp vitality when small mechanical or carious exposures occur. Polycarboxylate, silicate, and zinc phosphate cements lack the bioactive, hard tissue–stimulating properties offered by MTA. While other materials (like calcium hydroxide) also serve as pulp capping

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agents, MTA has become recognized as a gold standard. Hence, (B) is correct for common use in direct pulp capping.

167. (A) Because lingering thermal pain suggests irreversible pulpitis

Lingering or spontaneous thermal pain is a clinical hallmark of irreversible pulpitis, indicating that the inflammation has extended into the radicular pulp. A pulpotomy aims to save the radicular pulp if it's healthy, but irreversible pulpitis in permanent teeth typically necessitates complete pulp removal (pulpectomy) and subsequent root canal therapy. Pulpotomy in such scenarios would likely fail, as the radicular pulp is no longer vital enough for conservative treatment. The presence of deep caries and persistent thermal pain strongly points toward irreversible pulpitis, mandating full endodontic treatment rather than partial coronal intervention.

168. (B) Promoting thickening of dentinal walls and continued root growth

Traditional apexification in a necrotic tooth with open apices aims to induce a calcified barrier or place an artificial apical barrier (e.g., with MTA) to facilitate obturation. The procedure helps seal the canal but does not regenerate vital tissue or promote additional dentinal wall thickening. Continued root growth and thickening typically require a vital pulp or a revascularization approach, not classic apexification. The other listed objectives—establishing a barrier, avoiding overfill, and sealing the canal—are fundamental. Thus, (B) is the exception since apexification alone does not encourage further root development in necrotic cases.

169. (B) Apexification typically involves placing calcium hydroxide or MTA to form a barrier, whereas revascularization attempts to revitalize pulp

Apexification traditionally induces a calcific barrier at or near the apex of a necrotic tooth, enabling a sealed root canal filling despite the open apex. It doesn't restore pulp vitality or continued root wall growth. In contrast, revascularization aims to create an environment where new vital tissue can proliferate, potentially thickening dentinal walls and allowing normal root development. Revascularization does not require removing all coronal tooth structure, nor does apexification guarantee further wall thickening. Hence, statement (B) correctly distinguishes these two distinct approaches in endodontic management of immature teeth.

170. (A) Ferric sulfate or MTA on the radicular pulp

Pulpotomy success in young permanent molars depends on controlling hemorrhage and sealing the healthy radicular pulp. Ferric sulfate helps achieve hemostasis, while MTA is highly biocompatible and can promote a hard tissue barrier. These materials protect and encourage healing of the remaining vital pulp. Placing amalgam, composite, or gold foil directly onto the pulp without a pulp-protecting agent compromises viability. Typically, a restorative material then covers the pulpotomy site, but the immediate medicament is crucial for pulp survival. Hence, ferric sulfate or MTA is indicated to foster a stable environment and seal.

171. (C) Pulpotomy with MTA or similar agent

For a vital, partially developed permanent molar, the priority is to retain radicular pulp vitality to support continued root growth. A pulpotomy can remove infected coronal tissue while preserving healthy pulp in the roots. MTA or similar bioceramic materials encourage a biological seal and ongoing apexogenesis. Conventional root canal therapy is more invasive, typically reserved for irreversible pulpitis or necrosis. Extracting a newly erupted permanent tooth would lead to orthodontic or developmental issues, and placing a crown without addressing the pulp exposure fails to resolve the underlying inflammatory process. Hence, option (C) is best.

172. (C) Progressive, increasing discomfort even at rest

Normal postoperative sensitivity typically subsides or at least remains stable shortly after a restoration, particularly if it's mild and triggered by temperature or chewing. However, a gradually worsening dull ache or spontaneous pain that appears at rest can signal deeper pulp involvement or residual infection—possibly from caries that was inadequately removed. Sharp transient pain is more often associated with routine post-op sensitivity or occlusal high points. Intermittent mild pressure sensitivity may be benign. If the discomfort escalates

without external triggers, an underlying issue like unremoved caries or pulpitis is more likely.

173. (B) Use of a bonding agent or cavity varnish

Traditional technique often involved applying a varnish over the cut dentinal surfaces to reduce microleakage by sealing dentinal tubules and preventing fluid movement. More contemporary approaches may use a bonding agent under amalgam (bonded amalgam technique). Both methods help decrease post-operative sensitivity and infiltration by saliva or bacteria. While immediate polishing has some effect on the external margins, it isn't as effective at limiting initial microleakage. Large one-step increments can introduce condensation challenges, and omitting liners in deep cavities can lead to thermal shock or pulpal irritation. Thus, (B) is the recognized protocol.

174. (A) Check and adjust occlusion with articulating paper

Postoperative biting pain after a new restoration often results from a high occlusal contact. The restoration may be slightly proud of the normal bite, causing excessive load on that tooth during mastication. The simplest and most logical first step is to check the restoration's occlusion with articulating paper and carefully adjust any premature contact. Extraction or crowning is excessively drastic if the restoration is otherwise well placed. Re-bonding might be necessary if microleakage were suspected, but the most likely culprit in immediate biting discomfort is hyperocclusion, resolved through minor occlusal adjustment.

175. (C) Desiccating the dentin completely prior to primer

Overdrying the dentin can collapse the collagen network, preventing proper infiltration of the primer and compromising the bond. Current techniques emphasize gentle air drying to remove excess moisture without thoroughly desiccating the surface. Proper isolation, surface roughening, and using a recommended adhesive are vital steps for maximizing bond strength in a Class V non-carious or abrasion lesion. Complete dentin desiccation leads to suboptimal sealing and potential postoperative sensitivity. Therefore, step (C) is incorrect for modern bonding protocols, highlighting the importance of a moist—but not wet—dentin surface before primer application.

176. (C) Microleakage and bacterial invasion

Recurrent or secondary caries typically forms when marginal gaps permit oral fluids and bacteria to penetrate the interface between the restoration and tooth structure. This phenomenon is known as microleakage. Despite good thermal insulation or any occlusal factor, if a restoration's seal is compromised, bacterial colonization begins at the margin, leading to caries. Perfect adaptation and seal would prevent such infiltration, and high occlusion might cause mechanical issues but not specifically recurrent decay. Microleakage remains the principal cause, making option (C) the direct cause-and-effect mechanism behind recurrent caries.

177. (C) Palpable subgingival overextension of the restoration margin

An overhanging margin can irritate the gingiva, causing localized inflammation, swelling, and discomfort. A dentist may detect this overextension or "ledge" by gently exploring with an instrument at the gingival margin. The other options—pus from the apex, severe apical percussion sensitivity, or a radiolucency at the apex—suggest possible endodontic or periapical pathology. By contrast, a subgingival restoration overhang typically leads to soft tissue issues rather than direct pulp or periapical failure. Thus, option (C) specifically indicates the mechanical irritation from an overextended margin, consistent with local gingival swelling.

178. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Revascularization aims to foster bleeding into the disinfected root canal so newly formed vital tissue can continue root development. Aggressive mechanical instrumentation risks removing the dentinal walls that harbor stem cells or damaging the apical region, impeding the formation of a suitable scaffold for regenerative tissue. By minimizing instrumentation, clinicians preserve the environment where these cells can adhere and proliferate once the canal is disinfected. Thus, both the assertion—that minimal instrumentation is done—and the reason—that removing potential vital tissue is detrimental—are true, and the reason

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directly explains why minimal instrumentation is performed.

179. (B) An indirect restoration covering at least one cusp

Onlays are indirect restorations that involve the occlusal surface and extend over one or more cusps, offering extra reinforcement for weakened tooth structure without going to a full crown. They are typically fabricated in a lab or via CAD/CAM, then bonded or cemented in place. Direct fillings are placed chairside in a single appointment; full crowns encircle the entire tooth, and short-term temporaries do not remain as definitive solutions. Thus, describing it as "an indirect restoration covering at least one cusp" accurately defines an onlay.

180. (C) Etching the internal ceramic surface with hydrofluoric acid and applying silane

Bonding ceramic onlays requires a strong interface between the restoration and resin cement. By etching the internal surface with hydrofluoric acid, microscopic porosities form, enhancing mechanical interlocking. Then, silane is applied to chemically couple the ceramic to resin-based cements, improving bond strength and longevity. Eugenol-based cements inhibit resin polymerization, so they are avoided. Routinely grinding the occlusal surface of the onlay is not recommended, and storing in water does not specifically improve bonding. Therefore, HF etching plus silane coupling is the standard protocol for optimal ceramic onlay adhesion.

181. (C) It tolerates moisture better and releases fluoride

Glass ionomer cement (GIC) chemically bonds to tooth structure and releases fluoride, which can help remineralize tooth surfaces and reduce caries risk. Especially in cervical lesions on root surfaces where isolation can be challenging, GIC's moisture tolerance is advantageous compared to resin-based composites that demand a dry field for proper bonding. Additionally, GIC's fluoride release can be protective in patients prone to caries, such as older individuals with gingival recession or reduced salivary flow. Hence, (C) correctly states why GIC is often chosen over materials requiring stricter isolation and lacking fluoride benefits.

182. (C) Comprehensive mechanical retention of the restoration

A rubber dam is primarily used to isolate the operating field, improve visibility, and minimize contamination of the preparation or canal system with saliva or blood. It also protects the patient from accidentally swallowing or aspirating instruments or debris. However, the rubber dam itself does not provide mechanical retention for the restoration. Retention is determined by the cavity design, adhesive bonding, or restorative technique. While the dam aids dryness for better bonding, it does not physically lock the restoration into place. Thus, (C) is not an advantage conferred by the rubber dam.

183. (B) RMGI offers fluoride release and better bonding than ZOE

Resin-modified glass ionomer (RMGI) not only adheres chemically to tooth structure but also releases fluoride, supporting remineralization. ZOE cements, while sedative for the pulp, inhibit the polymerization of composite resins due to eugenol's interaction with the resin. Consequently, ZOE is often avoided directly under composite. RMGI also demonstrates improved physical properties and better moisture tolerance compared to conventional glass ionomer or ZOE. Thus, (B) accurately captures how RMGI outperforms ZOE in bonding capability and fluoride release, while dispelling the notion that ZOE is routinely used beneath resin restorations.

184. (C) Warm vertical condensation (continuous wave)

Warm vertical condensation—or the continuous wave technique—softens gutta-percha to achieve better adaptation, especially important in curved canals with irregular walls. This method enables plastic flow into lateral spaces and canal intricacies, producing a denser, more homogeneous obturation. Cold lateral condensation can sometimes leave voids or limited flow, while a single cone rarely offers optimal 3D fill unless combined with a specialized sealer approach. Silver points are largely obsolete due to corrosion and poor sealing. Thus, (C) is the recognized technique for thorough, dense filling in curved canals.

185. (C) Monitoring torque and replacing files showing fatigue

NiTi files can fracture when subjected to excessive torsional or cyclic fatigue, especially in curved canals. To minimize breakage, clinicians use torque-controlled endodontic motors, monitor the file for signs of wear or unwinding, and replace it before it fails. Excessive apical force or ignoring lubrication can create binding and stress, leading to instrument separation. Overextending beyond the apex does not prevent separation; it risks extruded debris and periapical trauma. Thus, careful use, respecting recommended speeds and torque settings, and replacing worn instruments are the key prophylactic measures against NiTi file separation.

186. (B) Adjust the occlusion and check for elimination of symptoms

If radiographic examination and clinical tests do not indicate a deeper endodontic or periodontal issue, a high restoration is often the simplest cause of tenderness on biting. The occlusal surface may be making premature contact, generating focal stress and discomfort. By reducing the high spot(s) and verifying with articulation paper, the dentist can often resolve the complaint promptly. Prescribing antibiotics without evidence of infection or scheduling surgery is not justified. Simply ignoring or dismissing the problem can worsen the patient's discomfort. Hence, occlusal adjustment is the logical immediate step.

187. (C) Leaving the tooth permanently open until the next appointment

Standard endodontic practice emphasizes sealing the tooth between appointments to prevent salivary contamination and reinfection of the canal system. Leaving a tooth "open to drain" for extended periods is an outdated approach that risks new bacterial ingress. Calcium hydroxide is a common intracanal medicament used between appointments to reduce microbial levels. Access preparation, determining the working length, and thorough canal debridement are core steps in multi-visit therapy. Therefore, the incorrect step is leaving the tooth open, which contravenes modern protocols for controlling infection and maintaining a sterile environment.

188. (C) Thinning of canal walls and predisposition to vertical root fracture

Over-enlarging the coronal or mid-root portion of the canal with large burs, or forcibly flaring it, can significantly reduce the remaining dentin thickness, weakening the root structurally. This raises the risk of vertical root fracture—an often irreparable complication. Endodontic shaping must balance adequate canal debridement with preservation of radicular dentin. Flaring the canal does not preserve pulp vitality or reduce fracture risk; if anything, it exacerbates potential structural compromise. Hence, (C) directly states the negative consequence of such aggressive instrumentation, linking cause (excessive flaring) with effect (root weakening/fracture risk).

189. (D) A progressively enlarging periapical lesion

A growing periapical radiolucency usually indicates ongoing pulpal necrosis or infection that has spread beyond the coronal area. If the radicular pulp were still vital, you would expect continued root development or healing at the apex, not a progressively enlarging lesion. Sensitivity to cold might suggest some vitality, albeit more typical of coronal pulp involvement. The absence of spontaneous pain doesn't rule out necrosis—some non-vital teeth remain asymptomatic for long periods. Hence, the key red flag is the radiographic evidence of an expanding periapical lesion, pointing strongly to pulpal necrosis.

190. (C) Assertion is true, but Reason is false.

Incremental placement of composite is a well-established technique to mitigate polymerization shrinkage stress and ensure thorough curing of each layer. This prevents large volumes of resin from contracting simultaneously. The statement about large bulk fills always allowing complete light penetration is generally inaccurate for deep preparations; standard composites often cannot be fully cured in one large bulk layer beyond 2–3 mm thickness. Bulk-fill composites exist but still have recommended thickness limits. Hence, while the assertion that incremental placement reduces shrinkage is true, the reason given—about complete light penetration with bulk fills—is false.

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191. (D) Cone-beam computed tomography (CBCT)

CBCT provides a three-dimensional view, allowing the practitioner to visualize root canal anatomy from multiple perspectives and identify additional or atypical canals that might not appear on a single-plane periapical radiograph. While apex locators and conventional radiographs assist in measuring working length or diagnosing periapical lesions, they can miss superimposed or intricately positioned canals. Bitewings are typically used to assess proximal caries or restoration margins. In cases of suspected missed canals, 3D imaging via CBCT is the most definitive tool for accurate canal detection.

192. (B) Polish and remove the overhang if feasible

Food impaction in a Class II area can arise from an overhang on the restoration margin. If the overhang is minor and accessible, a finishing bur or hand instruments (e.g., an amalgam knurled-file or ultrasonic tip) can carefully remove or smooth it, restoring proper contour and contact. This step often relieves the patient's symptoms without fully replacing the restoration. Antibiotics or root canal therapy would not address the mechanical cause of food trapping, and total restoration replacement might be indicated only if the overhang is large or if caries is also present. Hence, (B) is appropriate.

193. (C) Immediate pulpotomy with MTA

In a partially erupted molar with open apex, preserving pulp vitality is paramount for continued root formation. A pulpotomy can remove the superficial infected coronal pulp while maintaining healthy radicular pulp. MTA or similar bioceramic materials promote healing and can help form a hard tissue barrier. Direct pulp capping is typically considered for very small mechanical or traumatic exposures; extensive carious involvement may compromise success. Full pulpectomy leads to halted root development unless revascularization is attempted, which is less ideal if the radicular pulp is healthy. Extraction without broader orthodontic justification wastes a potentially salvageable tooth.

194. (B) Promoting thickening of dentinal walls and continued root elongation

Traditional apexification aims to produce an apical barrier (via calcium hydroxide or MTA) in a necrotic tooth with an open apex so a conventional root canal obturation can be completed. Regenerative endodontics, on the other hand, attempts to create a suitable environment for new vital tissue infiltration, potentially enabling ongoing root development, including increased root length and dentinal wall thickness. This outcome is the key difference from apexification, which doesn't achieve further tooth maturation. Hence, (B) clearly highlights the fundamental goal of regeneration—enabling continued physiological root growth in an immature necrotic tooth.

195. (B) It releases fluoride and tolerates slight moisture

In patients with high caries risk and subgingival lesions, glass ionomer is an advantageous restorative material. It bonds chemically to enamel and dentin, even in less-than-ideal moisture conditions, which often occur near the gingival margin. Additionally, fluoride release can help remineralize adjacent tooth surfaces and reduce secondary caries risk. This addresses both the restorative challenge and the patient's elevated caries susceptibility. While ideal isolation is recommended, GIC is notably more forgiving than composite resin. Hence, option (B) encapsulates the key reasons glass ionomer suits cervical or root-surface lesions in high caries-risk cases.

196. (A) Non-surgical root canal treatment

The standard of care for a necrotic pulp with a chronic apical abscess is to debride and disinfect the canal system via non-surgical root canal therapy. This allows resolution of the infection and healing of the periapical tissues. Apicoectomy (surgical endodontics) is generally reserved for situations where nonsurgical retreatment is not feasible or has failed. Extraction and implant placement is an option if the tooth is non-restorable or multiple endodontic attempts fail. Simply placing an inlay or restoration without addressing the necrotic pulp is inappropriate. Thus, (A) is the logical first step.

197. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

High-copper amalgams have largely replaced traditional low-copper formulas due to their improved mechanical properties and reduced corrosion at restoration margins. In low-copper

amalgam, the Sn-Hg gamma-2 phase is particularly susceptible to corrosion and breakdown. Increasing the copper content induces the tin to preferentially form a copper-tin (eta) phase, thereby drastically reducing the formation of gamma-2. This leads to more stable margins and less marginal ditching. Hence, the assertion—that high-copper amalgams have less marginal breakdown—and the reason—that copper reacts with tin to decrease gamma-2—are true, with the reason directly explaining the assertion.

198. (C) Epoxy resin-based (e.g., AH Plus)

Epoxy resin-based sealers, like AH Plus, are widely used for obturation because they offer good handling characteristics, flow, and a long working time that allows thorough canal filling. They adhere well to dentin and gutta-percha. However, they do undergo a degree of polymerization shrinkage. Zinc oxide eugenol-based sealers, glass ionomer-based sealers, and silicone-based sealers have their own properties but differ in setting chemistry and shrinkage. Epoxy resin sealers remain popular for their consistent clinical performance, even though slight shrinkage is a recognized property. Thus, (C) identifies this well-known group of sealers.

199. (C) To expose dentinal tubules and improve sealer penetration

The smear layer forms during instrumentation, comprising dentinal debris, organic matter, and microorganisms. It can obstruct dentinal tubules and hinder the sealer from sealing micro-spaces along the canal walls. By removing it (usually via EDTA and final irrigation protocols), the dentin surface is cleaned, allowing deeper sealer and gutta-percha adaptation. This helps reduce microleakage and potential bacterial colonization. Accelerating canal drying or creating undercuts is not the purpose here, and leaving contamination is obviously undesirable. Therefore, removing the smear layer to expose tubules for better sealing is the fundamental rationale.

200. (C) Continued microleakage at the restoration margins

A good long-term outcome in endodontics hinges on several critical factors: thorough cleaning and shaping to remove infected tissue, a proper obturation that seals the canals, and a durable coronal restoration preventing bacterial ingress. When a post is needed, it should be placed carefully to preserve root strength. Microleakage, however, undermines the entire process by allowing bacteria to re-enter and recolonize the canal system. Continued leakage at the margins is detrimental, not beneficial. Hence, (C) is the exception, as it does not improve but rather worsens the tooth's prognosis after root canal therapy.

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CHAPTER 08

ORTHODONTICS

1. (B) Embryonic morphogenesis

   Embryonic morphogenesis is the dynamic process in which cells and tissues arrange themselves to form distinct anatomical features, including the developing face and jaws. This involves the differentiation of embryonic layers (ectoderm, mesoderm, and endoderm) and the regulated signaling pathways that guide cranial neural crest cells into position. Osteogenic modeling and chondral migration occur later, influencing bone and cartilage growth rather than early tissue formation. Dermal proliferation refers more to skin development rather than the comprehensive structural shaping of the craniofacial complex. Thus, embryonic morphogenesis is the most accurate descriptor.

2. (B) Embryonic period (3rd to 8th week)

   The embryonic period, spanning from the 3rd to the 8th week of intrauterine life, is the critical window when the branchial (pharyngeal) arches form and actively develop into structures of the head, neck, and face. Each arch contains cartilaginous, muscular, vascular, and neural components that eventually contribute to distinct parts of the craniofacial region. By the fetal period, these features further refine but are already broadly established. The perinatal and neonatal periods occur around or after birth, making them irrelevant to the initial formation of pharyngeal arches.

3. (B) It provides progenitor cells for cartilage, bone, and connective tissues

   Neural crest cells migrate from the developing neural tube into the craniofacial region, where they differentiate into a variety of key structures including cartilage, bone, and connective tissues of the face. They are essential for shaping the jaws, pharyngeal arches, and several cranial nerves. While the neural crest also influences signaling and molecular patterning, its primary contribution involves supplying the cellular components that form skeletal and other supportive tissues. It does not replace mesoderm throughout the face, nor is it limited to a specific muscle group such as the tongue.

4. (D) Environmental gravity changes

   Prenatal craniofacial growth is primarily regulated by tightly controlled genetic signaling mechanisms, maternal nutrition, and the potential influences of teratogens (such as certain infections or drugs). These factors can significantly impact the development of the jaws, palate, and associated structures. While extreme environmental conditions can theoretically affect fetal positioning or fluid distribution, typical alterations in gravity (such as everyday changes in maternal posture) do not play a major or direct role in shaping the craniofacial complex. Hence, “environmental gravity changes” is not commonly recognized as a pivotal prenatal developmental factor.

5. (B) Maxilla (intramembranous) vs. ethmoid bone (endochondral)

   The maxilla develops largely through intramembranous ossification, wherein bone forms directly from connective tissue without a cartilaginous precursor. By contrast, the ethmoid bone arises through endochondral ossification, involving a cartilage template that is eventually replaced by bone. Understanding this distinction is key when analyzing craniofacial growth patterns and certain congenital anomalies. The mandible also has a predominantly intramembranous origin but includes secondary cartilages. The zygomatic bone develops via intramembranous ossification, not endochondral, and the nasal cartilage itself is not a fully ossified structure but rather a cartilaginous component.

6. (C) Frontonasal prominence

The frontonasal prominence is the central region from which the forehead, bridge of the nose, and primary structures of the midface develop. This prominence interacts with the paired maxillary prominences to form the upper jaw and much of the midfacial skeleton. Meckel's cartilage is associated with the lower jaw, while Reichert's cartilage pertains to the second branchial arch and contributes to the stapes and styloid apparatus. Palatine processes form part of the secondary palate rather than directly regulating the larger midfacial growth pattern, making the frontonasal prominence the key player.

7. (A) Cleft lip and/or cleft palate

Folic acid deficiency during the early embryonic period is well recognized as a major risk factor for orofacial clefts, especially cleft lip and/or palate. Folic acid is essential for proper cellular division and tissue formation. When maternal folate levels are insufficient, disruptions in neural crest cell proliferation, migration, or fusion events can occur, leading to cleft defects. Overgrowth of the mandible and hypertrophy of midfacial structures are not typical manifestations of folate deficiency. Early fusion of cranial sutures (craniosynostosis) involves separate genetic or environmental mechanisms.

8. (C) Folic acid supplementation

Folic acid supplementation, especially before conception and continuing through the first trimester, significantly reduces the risk of neural tube defects and orofacial clefts. Its role in DNA synthesis and repair supports crucial embryological developmental processes. Tetracycline is contraindicated during pregnancy, as it can affect fetal teeth and bones. Bed rest in the last trimester does not address early embryological needs. Postnatal screening, while beneficial for early detection, does not prevent the occurrence of these anomalies; it simply aids in timely intervention after they have developed.

9. (B) Fusion of palatine shelves

The palatine shelves (also called palatine processes of the maxilla) must elevate, approach each other, and fuse at the midline to form the secondary palate, thereby creating a partition between the oral and nasal cavities. Failure in any step of this process can result in cleft palate. While the nasal processes help form the external nose, they do not separate the cavities internally. Downward rotation of the septum helps align the nasal passages but is not the critical event in forming the palate. The temporal bone does not contribute to palate formation.

10. (C) Nasal cartilage has no role in midfacial growth after birth

Nasal cartilage, particularly the septal cartilage, exerts an ongoing influence on the growth of the midface postnatally by maintaining tension on the sutures and providing a framework for continued bone deposition. The mandible does indeed remodel at the condylar region, shaping its height and position. The maxilla expands through alveolar growth and sutural activity, particularly around the zygomatic and other craniofacial sutures. Cranial base synchondroses, like the spheno-occipital synchondrosis, help determine facial projection and dimensions well into adolescence, making that statement valid.

11. (C) Cranial vault circumference

The cranial vault, which houses the brain, experiences rapid growth early in life corresponding to the expanding brain volume. Its growth completion is largely achieved by around 7–8 years of age. Mandibular ramus height and condylar remodeling extend through adolescence into early adulthood, shaping lower facial height. Nasomaxillary complex width also continues to expand with alveolar and suture growth until the mid-to-late teenage years. Thus, among these options, the cranial vault circumference generally ceases major growth changes earliest.

12. (B) Deficient mandibular length

The condylar cartilage in the mandible contributes to lengthening the lower jaw. If this cartilage's growth is diminished or damaged, the anteroposterior dimension of the mandible remains shorter than expected, manifesting as retrognathia or underdeveloped jaw length. Excessive posterior facial height would require excessive vertical growth of the ramus. Widened zygomatic arches and accelerated maxillary transverse expansion are influenced by maxillary and zygomatic region growth, which are not directly governed by the

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mandibular condyle. The primary effect of reduced condylar growth is short mandibular length.

13. (C) Intrauterine mandible constraint

Pierre Robin sequence commonly begins with an underdeveloped mandible (micrognathia) early in gestation, sometimes due to intrauterine constraint or reduced fetal jaw movement. This underdevelopment initiates a chain reaction: the small mandible pushes the tongue upward and backward, impeding normal palatal shelf closure, sometimes leading to a cleft palate. Overgrowth of the maxilla or excessive folic acid are not linked to this phenotype, and premature cranial suture fusion (craniosynostosis) primarily affects the shape of the cranial vault, not the mandibular dimension. Thus, intrauterine mandible constraint best explains the hallmark features of Pierre Robin sequence.

14. (B) Migration of neural crest cells into the first and second branchial arches

Treacher Collins syndrome is characterized by underdeveloped facial bones, particularly in the zygomatic and mandibular areas, due to faulty migration or proliferation of neural crest cells destined for the first and second branchial arches. These arches give rise to key structures like the mandible, maxilla, and zygoma. The fusion of the medial nasal and maxillary processes relates to cleft lip or palate formation, whereas downward growth of the primary palate and expansion of the spheno-occipital synchondrosis concern midface and cranial base development, respectively. The core defect in Treacher Collins involves neural crest cell disturbances.

15. (B) Use of functional appliances

Functional orthopedic appliances aim to harness or redirect growth by placing controlled forces on the mandible and surrounding musculature. In cases of condylar hypoplasia, these appliances encourage mandibular positioning that may stimulate or optimize condylar growth potential, improving jaw alignment over time. Surgical resection of the condyle would worsen the deficiency rather than correct it. Early extraction of primary molars is not a standard measure for promoting mandibular growth; it primarily addresses space management issues. Fixed orthodontic brackets alone cannot significantly alter skeletal growth; they focus on tooth alignment within existing jaw relationships.

16. (B) At key developmental milestones (birth, 6 months, 1 year, annually thereafter)

Craniofacial growth patterns are closely tied to overall child development. Most pediatric guidelines advise measuring head circumference and facial proportions at birth, 6 months, and 1 year, then annually through early childhood to track any deviations or emerging anomalies. Monthly measurements for the first five years are generally unnecessary unless there is a specific concern. A single measurement at birth fails to capture ongoing changes, and measuring every six months until 18 years would be impractical, extending well beyond typical pediatric protocols. Regular milestone-based evaluations help detect issues early for timely intervention.

17. (B) Noticeable facial asymmetry that worsens after infancy

Facial asymmetry that intensifies over time could indicate a growth disturbance or an underlying syndrome, especially if it involves skeletal components such as the mandible or maxilla. Mild mandibular retrognathia in neonates often resolves with normal postnatal growth. An anterior open bite in mixed dentition can stem from habits like thumb sucking and is not always syndromic. A small diastema might resolve when permanent canines erupt. By contrast, progressive skeletal asymmetry should prompt thorough evaluation to rule out conditions like hemifacial microsomia or other genetic disorders impacting symmetrical craniofacial growth.

18. (C) Prominent nasal bridge with a flattened midfacial region

When the maxilla fails to grow forward adequately, the midface can appear recessed, emphasizing the nasal bridge. This visually presents as a flattened midfacial region when viewed in profile. In contrast, forward midfacial placement indicates normal or excessive maxillary growth. Increased lower facial height often corresponds to vertical growth patterns rather than isolated maxillary deficiency. Excessive overjet with a deep labiomental fold typically indicates a pronounced mandibular retrusion or a

combination of maxillary protrusion and mandibular deficiency, not an isolated lack of maxillary forward growth. Thus, a visibly prominent nasal bridge and flattened midface define maxillary undergrowth.

19. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Craniofacial growth after birth is a complex interplay of inherited patterns and mechanical stimuli. Genes establish the basic blueprint of bone growth, whereas functional forces—like mastication, swallowing, and certain oral habits—can shape remodeling processes. Muscle attachments and occlusal forces help guide the jaw's direction and magnitude of growth, leading to adaptation in bone morphology. Therefore, both statements are correct, and the reason directly supports the assertion. Genetic potential sets the stage, but environmental factors (especially functional loads) refine or modify the final form, validating the functional matrix concept in craniofacial biology.

20. (B) High-pull headgear to control vertical maxillary excess

High-pull headgear is designed to deliver upward and backward forces to the maxilla, restraining downward maxillary growth and helping control a long-face tendency. This approach seeks to limit vertical eruption of posterior teeth, reducing vertical facial dimensions. Growth inhibitor injections are neither standard nor ethical in orthodontic practice. Extraction of primary incisors will not address vertical facial growth patterns; it merely affects anterior spacing. Posterior bite blocks can help control eruption in some situations, but they do not "stimulate open bite"; instead, they can reduce molar eruption and promote autorotation of the mandible.

21. (D) Lateral cephalogram

A lateral cephalogram captures a standardized lateral view of the head, allowing precise measurement of skeletal landmarks and enabling assessment of jaw relationships, facial height, and growth direction. Orthopantomograms (OPGs) provide a panoramic view focusing on dentition, alveolar bone, and related structures but lack the specific angular and linear measurements crucial for growth evaluations. Bitewing radiographs reveal details about posterior teeth and interproximal caries, not skeletal relationships. Hand-wrist radiographs are used to evaluate skeletal maturity, not craniofacial proportions directly. Consequently, the lateral cephalogram is the key investigation for analyzing growth patterns.

22. (B) Nasal septum

Chronic nasal obstruction forces mouth breathing, often altering normal downward and forward growth of the nasomaxillary region. The nasal septum is crucial in guiding midfacial development. When airflow through the nose is reduced, septal cartilage stimulation for forward and downward movement diminishes, potentially hindering vertical growth of the maxilla. The alveolar process and mandibular body adapt largely to occlusal function and muscle forces, whereas the temporomandibular joint adjusts to changes in jaw posture. The nasal septum, therefore, is most directly affected by prolonged mouth breathing and compromised nasal airflow.

23. (B) Reduced septal cartilage-driven maxillary growth

Nasal septal cartilage plays a pivotal role in directing maxillary growth downward and forward. Chronic allergic rhinitis often causes persistent mouth breathing, minimizing normal nasal airflow and decreasing the mechanical stimulus for nasal septum elongation. This reduced stimulation can compromise forward maxillary growth, resulting in a longer, narrower face and a constricted maxillary arch. Impaired alveolar bone growth is typically a secondary effect of altered breathing or occlusal forces. An overdeveloped mandibular symphysis is unconnected to nasal obstruction. Early suture closure generally causes more global skull deformities rather than the described mouth-breathing phenotype.

24. (C) It restricts the septal cartilage's full development

Chronic mouth breathing reduces nasal airflow, compromising the functional matrix that normally stimulates septal cartilage growth. The septal cartilage exerts a forward and downward pulling force on the maxilla, influencing midface development. When nasal breathing is impaired, this mechanical stimulus diminishes, resulting in inadequate maxillary projection and an elongated

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lower facial profile. Displacement of the zygomatic arch forward or early suture closure are not typical mouth-breathing sequelae. While the lowered tongue posture can influence palate shape, the most direct effect in this scenario involves the growth restriction of the nasal septum.

25. (C) Nasal septum

Chronic nasal obstruction leads to mouth breathing, reducing the normal force and stimulation on the nasal septum essential for midface development. The nasal septum's cartilaginous extension guides the maxilla's downward and forward growth, which helps establish normal palatal width and facial proportions. When this mechanism is disrupted, a high-arched palate and unilateral posterior crossbite can result. While the palatine processes form the palate's structure, they respond to the broader skeletal environment. The zygomatic bone and frontal bone are less directly responsible for alveolar or palatal development, making the septum the central factor here.

26. (B) A balanced relationship with the mesiobuccal cusp of the upper first molar in the buccal groove of the lower first molar

In Angle's classification, normal occlusion describes a harmonious molar relationship where the mesiobuccal cusp of the maxillary first molar occludes with the mesiobuccal groove of the mandibular first molar. This arrangement typically aligns other teeth in proper intercuspation and provides stable function. End-to-end molar contact implies malocclusion. Complete overlap of lower teeth by upper teeth may suggest excessive overbite. A slight overjet and overbite are within normal limits, but numeric values alone do not capture the standard anteroposterior relationship. Hence, the key feature is the correct molar relationship.

27. (D) Early extraction of primary canines

Normal occlusion develops when tooth eruption follows the typical sequence, jaw growth supports adequate arch length, and balanced muscular forces from the lips, cheeks, and tongue guide tooth positions. Early extraction of primary canines is generally contraindicated unless there is a specific orthodontic indication, as it risks losing arch integrity and can disrupt the normal eruption pathway of permanent canines. Maintaining natural tooth eruption and arch space is typically preferred to support a stable occlusal relationship. Therefore, while the other factors positively impact occlusal harmony, premature canine extraction can be detrimental.

28. (B) The mesiobuccal cusp of the upper first molar aligns with the mesiobuccal groove of the lower first molar

Angle's classification focuses on the first permanent molar relationship, which can predict overall occlusal patterns. In Class I, the mesiobuccal cusp of the maxillary first molar sits in the mesiobuccal groove of the mandibular first molar. This often corresponds to an acceptable occlusal scheme, although minor misalignments can still be present in individual teeth. A 5 mm or more forward positioning of upper incisors suggests an excessive overjet rather than Class I molar relationship. Distal positioning of the lower molar and lingual occlusion of the upper incisors describe Class II and reverse bite tendencies, respectively.

29. (B) Retroclined upper incisors

Angle's Class II division 1 is characterized by a large overjet, often because the maxillary incisors are proclined or the mandible is retruded (or both). This can lead to a prominent upper dental arch relative to the lower, frequently causing a deep overbite. While some Class II malocclusions present with an overdeveloped maxilla, more commonly it's a mandibular deficiency that contributes to the discrepancy. Retroclined upper incisors are a hallmark of Class II division 2, not division 1, making them an exception within the typical division 1 malocclusion features.

30. (B) Class III often exhibits a reverse overjet or underbite

Angle's Class III malocclusion typically involves the lower first molar mesially positioned relative to the upper first molar, frequently manifesting as an anterior crossbite or underbite. This contrasts with Class I, where the first molars meet in a neutral relationship. While maxillary underdevelopment or mandibular prognathism can be underlying causes, not all Class III cases reflect a purely prognathic mandible. The characteristic dental sign is a reverse

overjet, where the lower incisors are ahead of the upper incisors. A Class III relationship can indeed be influenced by various skeletal discrepancies.

31. (C) Orthodontic alignment with possible minor stripping or expansion

When the fundamental skeletal relationship is Class I, minor dental crowding can often be corrected through orthodontic alignment techniques such as minor arch expansion or interproximal enamel reduction ("stripping") to create space. Surgical mandibular setback or maxillary advancement is reserved for significant skeletal discrepancies, which are not indicated here. Extraction of four premolars is a more invasive strategy usually pursued in cases of severe crowding or significant orthodontic camouflage needs. Hence, simple orthodontic measures aimed at modestly increasing arch perimeter or recontouring tooth surfaces typically suffice for mild anterior crowding in a Class I relationship.

32. (B) An 8-year-old with early mesial shift of molars and mild crowding in the anterior region

Interceptive orthodontics focuses on addressing developing problems in the mixed dentition stage to guide proper occlusal and jaw relationships. An 8-year-old typically has a mix of primary and permanent teeth, so managing the early mesial shift or crowding can help prevent complex malocclusions later. A 16-year-old with a fully erupted permanent dentition usually requires comprehensive orthodontic treatment, not purely interceptive measures. A 25-year-old with a diastema is well past the mixed dentition stage. A 12-year-old with normal occlusion does not require intervention. Thus, the 8-year-old scenario fits the interceptive orthodontic approach.

33. (B) Removable appliance with an anterior bite plane or Z-spring

Early correction of a single-tooth anterior crossbite in the mixed dentition can prevent asymmetric wear, gingival recession, or the development of a skeletal discrepancy. A removable appliance—often featuring springs or bite planes—can tip the incisor into its proper position. Extraction of the opposing tooth is contraindicated, as it can cause further occlusal imbalance. Simply waiting until all incisors erupt risks entrenching the crossbite and complicating correction. Mandibular setback surgery is extreme and reserved for significant skeletal issues in older patients whose growth is nearly complete. Thus, a removable appliance is the best early intervention.

34. (B) Focus on spotting and correcting developing problems early

Interceptive orthodontics aims to identify and manage early dental and skeletal irregularities during mixed dentition, potentially preventing more severe malocclusions later. This may involve space maintainers, habit-breaking appliances, or minor tooth movement to foster normal jaw development. Comprehensive orthodontics typically addresses established malocclusions when most or all permanent teeth have erupted. Not all interceptive care uses primary dentition exclusively, as mixed dentition is common. Premolar extraction and fixed appliances are not mandatory in interceptive orthodontics, which emphasizes timely intervention with minimal procedures to rectify emerging orthodontic problems before they escalate.

35. (C) Extracting fully healthy primary teeth without justification

Proper interceptive orthodontic diagnosis requires a thorough clinical exam, including observation of harmful habits (e.g., thumb sucking), and radiographic evaluation to check tooth eruption paths and any anomalies. Assessing both centric occlusion and excursive jaw movements helps identify developing malocclusions. Extracting healthy primary teeth without clear rationale is not a standard diagnostic step and can lead to space loss or disrupt normal eruption sequences, creating more complex problems. Any tooth extraction must be justified by a valid clinical or radiographic finding, underlining the importance of a well-structured treatment plan.

36. (C) Thumb crib or habit breaker appliance

A thumb crib or habit breaker appliance is specifically designed to discourage the digit-sucking habit by making it uncomfortable or physically blocking the thumb from contacting the palate. This facilitates spontaneous correction of the anterior open bite if the habit ceases early. High-pull headgear addresses

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vertical overgrowth of the maxilla. A removable Hawley retainer is typically used after orthodontic alignment, not primarily for habit breaking. Serial extraction strategically removes certain primary or permanent teeth to guide eruption patterns, which does not directly address a persistent thumb-sucking habit.

37. (D) Long-face syndrome with narrow maxillary arch

Chronic mouth breathing disrupts the normal balance of nasal respiration and tongue posture. When the tongue rests low in the mouth, the maxillary arch often does not receive the usual lateral expansion force. This results in a high-arched, constricted palate, and can be accompanied by increased lower facial height due to altered vertical jaw growth (sometimes called "long-face syndrome"). Though large overjet, posterior open bite, and unilateral crossbite can occur in various malocclusions, the typical mouth-breathing presentation includes a narrower maxillary arch and elongated facial appearance, making option (D) the most likely outcome.

38. (B) Lip bumper device

A lip bumper in the lower arch can help reposition the lower lip away from the lingual surface of the upper incisors, reducing excessive labial pressure that leads to incisor proclination. The device creates space and modifies muscular forces, often alleviating the lip trap habit. Orthognathic surgery is too invasive and typically reserved for older adolescents or adults with significant jaw discrepancies. Expansion appliances correct transverse arch deficiencies, not specifically a lip trap. Removable functional appliances may modify jaw positioning but are less effective for directly addressing a localized lip trap habit in early childhood.

39. (C) Band and loop space maintainer

When a single primary second molar is lost prematurely on one side, a band and loop space maintainer is typically used to preserve the mesiodistal space. This simple device anchors to an adjacent tooth (often the first permanent molar) and extends a loop to maintain the necessary gap. A lingual holding arch is indicated when bilateral lower primary molars are missing. Transpalatal arches with acrylic buttons and Nance appliances are upper arch appliances that stabilize molar positions, usually when multiple teeth are lost or to prevent mesial drift of molars bilaterally.

40. (D) Placement of a unilateral space maintainer

When a primary tooth is lost prematurely, adjacent teeth tend to drift, encroaching on the space needed for the successor. A unilateral space maintainer—such as a band and loop—helps preserve that space until the permanent tooth erupts. Immediate partial dentures serve more cosmetic functions (especially for anterior teeth) and are not typically used for posterior space maintenance in children. A bilateral Nance appliance is for upper arch situations where bilateral teeth are missing or major anchorage is required. Waiting for visible crowding is risky because preventive space maintenance is more effective.

41. (C) Only after the erupting permanent tooth breaks the gum surface

Space maintainers remain in situ until the permanent successor is about to erupt through the gingiva, ensuring that no drift compromises the eruption path. Removing the appliance too soon can risk space loss. Discomfort may occur initially but should be managed through appliance adjustments rather than immediate removal. Radiographic visibility of the tooth bud alone is not a definitive indicator for removal, as several months or more may pass before eruption. Arbitrary age markers, like 10 years old, ignore individual developmental variation. Thus, removal typically aligns with visible eruption in the mouth.

42. (B) Congenital absence of permanent tooth buds

Significant arch length discrepancies can occur if multiple permanent teeth are missing congenitally, such as in hypodontia or oligodontia. In such cases, the absence of permanent tooth buds drastically alters expected eruption sequences and spacing. Juvenile hypothyroidism can delay dental eruption but doesn't necessarily cause severe arch length loss. TMJ ankylosis predominantly affects mandibular function and vertical jaw development. Early closure of the mid-palatal suture would impact transverse arch width rather than a generalized arch length discrepancy. Thus, evaluating for congenitally

missing teeth is crucial in children with widespread primary tooth loss.

43. (B) Gingival inflammation or ulceration beneath the appliance

Space maintainers should be passive and not irritate soft tissues. Persistent gingival inflammation or ulceration directly beneath or adjacent to the appliance is a strong indicator that it is impinging or has become ill-fitting. Minor tooth mobility can stem from normal growth or slight orthodontic adjustments. Chewing difficulty and drooling can occur temporarily but do not necessarily signal urgent appliance misfit. The presence of inflammation implies the appliance is pressing improperly, necessitating professional evaluation, adjustment, or redesign to ensure both effectiveness and comfort for the child.

44. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Regular monitoring of space maintainers ensures they remain well-adapted as the child's dentition evolves. With continuous jaw growth and the emergence of permanent teeth, the appliance may become too tight or no longer accurately seated. In addition, changes in gingival contour can cause irritation if the appliance is not adjusted. Because these developments are inevitable in a growing child, periodic checkups are essential for early intervention. Both the assertion and the reason are correct, and the reason precisely explains why periodic reviews are necessary for maintaining a proper fit.

45. (A) Tongue crib or tongue guard

Tongue-thrust habits can maintain or worsen an anterior open bite if left unchecked. A tongue crib or guard is designed to discourage forward placement of the tongue during swallowing and at rest, helping the bite close as the habit diminishes. Fixed orthodontic braces might be indicated later if alignment issues persist but do not alone address the habit's underlying cause. Extraction of lower incisors is not a standard approach to open bite correction and could lead to undesirable spacing or occlusal changes. Some habits self-correct, but persistent open bites merit intervention.

46. (C) Orthopantomogram (OPG) plus Anterior Occlusal View if needed

The OPG provides a broad overview of the jaws, allowing the clinician to identify the presence, approximate angulation, and location of unerupted canines. However, maxillary canines may be difficult to localize precisely in some OPGs if they overlap other structures, so an additional anterior occlusal radiograph can provide better buccolingual positioning details. A single periapical radiograph might be insufficient for comprehensive positioning unless carefully angled. Lateral cephalogram mainly helps evaluate skeletal relationships in the anteroposterior plane, rather than the precise location of an impacted or unerupted canine.

47. (A) Bluegrass appliance

The Bluegrass appliance features a spinning bead or roller on the palatal side, providing a tactile alternative for the child's tongue while actively blocking comfortable thumb placement. This dual action helps divert the child's habit and correct the proclination of upper incisors over time. A Hawley retainer stabilizes tooth positions post-orthodontics rather than preventing digit habits. Class II elastics address anteroposterior skeletal discrepancies and do not directly inhibit thumb sucking. A chin cup primarily manages excessive mandibular growth. Therefore, the Bluegrass appliance is the specialized solution for discouraging thumb entry.

48. (C) Extraction of the ankylosed primary tooth and guidance of eruption

Ankylosed primary teeth do not exfoliate normally because their periodontal ligament is replaced by bone, fusing the tooth to the alveolus. This can deflect the path of the developing permanent tooth. In such cases, extracting the ankylosed tooth at an appropriate time prevents further ectopic eruption and allows the permanent incisor to assume a more normal position. Space regainer appliances address posterior space loss, not anterior impaction. Delaying extraction risks exacerbating malposition. Surgical exposure is typically reserved for impacted permanent teeth that fail to erupt, whereas guided eruption may suffice once the primary tooth is removed.

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49. (D) Simple tooth movement

A removable inclined plane appliance facilitates labial tipping of the malpositioned incisors in an anterior crossbite, primarily achieving dental movement rather than major skeletal corrections. Growth redirection involves influencing jaw growth, which typically requires specialized functional appliances, not a simple inclined plane. Dental arch expansion uses appliances like expanders to widen the arch. Functional re-education targets muscular or occlusal forces, such as breaking a thumb-sucking habit or encouraging a correct swallowing pattern. In this scenario, the direct tipping of permanent incisors with an inclined plane exemplifies straightforward tooth movement for crossbite correction.

50. (B) Dental compensation for incisor position

The proposed removable appliance targets incisor tooth movement rather than altering the skeletal relationship. By covering the lower incisors, it reduces their anterior interference and permits the upper incisors to move forward, effectively correcting the developing Class III incisor relationship. Skeletal realignment would require more robust functional appliances or orthopedic interventions if a true skeletal Class III existed. Sutural expansion is used to widen the maxilla and is not indicated here. Condylar growth stimulation might be considered in cases of mandibular deficiency, which is not the issue in an isolated anterior crossbite scenario.

51. (B) Edge-to-edge bite

An edge-to-edge bite refers to a situation in which the incisal edges of the upper and lower anterior teeth meet directly, with no overlap either vertically or horizontally. It differs from an anterior crossbite, where the lower incisors are ahead of the uppers. Reverse overjet is another name for underbite, where lower teeth protrude beyond the uppers. A posterior open bite involves a lack of contact in the posterior region. Thus, "edge-to-edge" distinctly pinpoints direct incisal contact without the normal overjet or overbite seen in typical occlusion.

52. (B) Angle's classification

Angle's classification is foundational in orthodontics for describing anteroposterior relationships based on the position of the upper and lower first permanent molars. It identifies Class I, Class II (divisions 1 and 2), and Class III malocclusions. Dewey further subdivided Angle's classes but did not replace Angle's core system. Ackerman and Proffit propose a broader framework focusing on facial proportions and arch alignment but do not supplant Angle's classic molar-based approach. Martin Dewey contributed refinements but is not a separate classification. Thus, Angle's classification remains the standard reference.

53. (B) Overbite

Overbite measures the vertical overlap of upper incisors in relation to lower incisors. It describes how much the upper anterior teeth cover the lower anterior teeth when the jaws are closed. By contrast, overjet represents the horizontal distance between incisal edges of upper and lower anteriors. Crowding relates to tooth-size/arch-size discrepancies, while a Bolton discrepancy compares mesiodistal tooth width ratios between upper and lower arches. Because overbite specifically addresses the vertical dimension of occlusion, it plays a key role in diagnosing open bite, deep bite, or normal vertical incisor relationships.

54. (A) Excessive incisal display

In a deep bite, the upper incisors overlap the lower incisors substantially, often resulting in palatal mucosal trauma from the lower incisors and reduced lower facial height. The vertical overlap is beyond normal limits. However, excessive incisal display often happens with an increased overjet or a gummy smile scenario, not typically associated with a deep bite. A pronounced deep bite can actually reduce the visible portion of the lower incisors, making (A) the incorrect or exception statement among otherwise common deep bite findings.

55. (C) Mandible itself is retrusive relative to the cranial base

A skeletal Class II malocclusion indicates an underlying jaw relationship discrepancy, commonly with a retrusive mandible or occasionally an advanced maxilla. In contrast, a purely dental Class II may be caused by tooth positioning (like proclined upper incisors or mesially drifted maxillary molars) while skeletal bases remain normal. Thus, if

cephalometric analysis shows the mandible set back relative to the cranial base, it signals a skeletal disharmony. The positioning of anterior teeth (A, B) might also occur, but that alone doesn't confirm skeletal involvement. Normal molar alignment (D) would not represent Class II at all.

56. (B) Growth potential of the patient

In a growing patient, functional or orthopedic appliances (e.g., a Twin Block) can harness remaining growth to modify the jaw relationship. If the patient's growth potential is limited or near completion, skeletal corrections are more difficult, and orthodontic camouflage becomes a likely alternative by adjusting tooth positions to mask the jaw discrepancy. While facial esthetics and crowding levels are considerations in treatment planning, the fundamental divide between orthopedic intervention and camouflage hinges on whether the skeletal discrepancy can still be modified via growth. An anterior open bite does not dictate Class II management approach directly.

57. (C) An inclined plane or removable acrylic appliance

When a Class III incisor relationship arises from dental positioning rather than skeletal discrepancy, a simple inclined plane or acrylic appliance can reposition the anterior teeth. Reverse-pull headgear (facemask) is indicated if there is maxillary deficiency (skeletal Class III). A chin cup aims to restrict excessive mandibular growth, which is not needed if skeletal bases appear normal. Fixed maxillary expansion is primarily for transverse deficiencies. Hence, if the jaw bases are determined normal on cephalometrics, a removable appliance to tip the incisors is a more appropriate interceptive measure for correcting the developing Class III tooth relationship.

58. (B) Stripping (interproximal reduction) of primary canines

At 12, the child is in the mixed dentition phase with some primary teeth still present. When minor crowding (around 3 mm) is evident, interproximal reduction (stripping) of primary canines can create extra space for the erupting permanent canines. This interceptive measure may alleviate anterior irregularity, potentially avoiding more aggressive extraction of permanent teeth. A lingual holding arch is used more often to maintain space in the lower arch when multiple primary molars are lost prematurely. Comprehensive fixed appliances might be needed later, but interceptive stripping is often tried first.

59. (A) Early mixed dentition eruption timing

In interceptive orthodontics, it's crucial to understand which permanent teeth have erupted and which are still to come. Tracking eruption timing and sequence identifies potential space management issues, such as the need to preserve space for canines or manage early loss of primary molars. Overbite severity, facial esthetics, and tongue posture are also relevant but come after determining the child's current dentition status. Properly timing interventions around eruption milestones can prevent crowding from escalating and may minimize extractions or lengthy future treatments. Hence, evaluating eruption timing is the foundational first step.

60. (B) Immediate extraction of permanent incisors if minor anterior crowding is found

Interceptive orthodontics encourages conservative measures to guide proper dental and facial development. Immediate permanent incisor extraction is rarely indicated for minor crowding and can jeopardize functional and esthetic outcomes. The correct steps include taking a thorough dental history, performing a clinical exam, and reviewing radiographs to track tooth development and eruption patterns. Continued monitoring is essential to adjust treatment as the child grows. By contrast, extracting permanent incisors prematurely can cause unintended occlusal problems and hamper future orthodontic possibilities. Therefore, step (B) is the incorrect or inappropriate action.

61. (C) Anterior open bite and proclined upper incisors

Prolonged thumb sucking typically exerts forward pressure on the upper incisors, leading them to tip labially. Meanwhile, the lower incisors can tilt lingually and an anterior open bite often develops because the thumb rests between the upper and lower front teeth. Posterior crossbites can arise from mouth breathing or unilateral chewing habits. Bimaxillary protrusion is characterized by forward inclination of both upper and lower

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incisors without necessarily an open bite. A Class III skeletal relationship commonly stems from jaw discrepancies, not habitual thumb sucking. Thus, (C) is the most likely outcome.

62. (A) Narrowed maxillary arch

Mouth breathing displaces the tongue downward and away from the palate, eliminating the normal lateral support the tongue provides during swallowing and rest. Over time, the maxillary arch can become constricted, leading to a high-arched palate and possible posterior crossbite. Distal shifting of lower molars is not a primary effect of mouth breathing. While certain lower incisors may procline in compensation, that is not the typical or exclusive finding. Increased posterior vertical dimension may occur in a long-face pattern, but the most direct effect is arch narrowing from inadequate palatal expansion forces.

63. (B) To eliminate the cause of reduced nasal airflow

Chronic mouth breathing frequently stems from partial or total nasal obstruction caused by allergic rhinitis, enlarged adenoids, or other nasopharyngeal issues. Identifying and treating these underlying medical problems—such as through allergy management or adenoidectomy—can restore normal nasal breathing. This in turn helps correct the low tongue posture that contributes to a pinched midface and a narrow arch. Antibiotics are indicated if infection is present, not for general obstruction. Palatal defects usually present more obviously, whereas forced permanent tooth extractions address crowding but do not resolve the primary breathing issue. Thus, addressing the airway cause is essential.

64. (B) Functional unilateral crossbite

When a child exhibits a unilateral posterior crossbite but lacks skeletal or dental midline discrepancies, a functional shift is often at play. The arches may be symmetrical, but the mandible shifts laterally during closure to accommodate occlusal interferences, creating the unilateral crossbite appearance. A true unilateral maxillary deficiency would show morphological differences. Bilateral crossbite masked by shift usually involves symmetrical issues that still appear in both arches on closer inspection. Tongue thrust patterns primarily affect anterior open bites. Therefore, a "functional unilateral crossbite" is the most fitting diagnosis.

65. (B) Use of a removable expansion plate or quad-helix

Functional unilateral crossbites usually result from a narrow maxilla or occlusal interferences that force the mandible to shift upon closure. Early interceptive orthodontic expansion (e.g., with a removable plate or a quad-helix) can correct the transverse discrepancy, encouraging a normal bite without surgical intervention. Observation often allows the crossbite to persist and can lead to asymmetric jaw development. Interproximal stripping of posterior teeth is rarely used for lateral width discrepancies; it is more relevant to mild crowding. Surgery is too invasive for a child, especially when simpler interceptive measures are typically effective.

66. (A) Immediate correction to prevent asymmetrical growth

Crossbites, particularly posterior crossbites, can lead to functional shifts and subsequent asymmetrical mandibular growth if not corrected early. Orthodontic guidelines advise addressing such crossbites during the mixed dentition, when the jaw still has growth potential and can adapt easily to expansion or other interceptive measures. Delaying until all permanent teeth erupt risks establishing an entrenched crossbite and possible skeletal asymmetry. Extraction of multiple primary molars is not the standard for crossbite correction, and expansion is indeed appropriate and commonly employed for skeletal or functional crossbites in mixed dentition.

67. (B) Cleidocranial dysplasia

Cleidocranial dysplasia is a genetic condition that can manifest as delayed or failed eruption of permanent teeth, often because of multiple supernumeraries or other dental anomalies. The absence of these teeth on radiographs could suggest congenital anomalies associated with this syndrome. Ankylosis involves fused teeth but typically shows existing permanent tooth germs. Hypopituitarism can delay eruption but does not eliminate teeth from radiographic view. Traumatic intrusion affects an already erupted tooth. Thus, when permanent incisors are radiographically absent without another

explanation, cleidocranial dysplasia (or another genetic cause of missing teeth) must be explored.

68. (C) Anterior open bite in the presence of a strong digit-sucking habit

Habit-induced malocclusions, such as those caused by thumb sucking or tongue thrusting, typically manifest as anterior open bite and incisor flaring due to prolonged, abnormal pressure. Bilateral symmetrical maxillary constriction may result from nasal obstruction or congenital issues. A reverse overjet without functional shift often indicates a Class III skeletal pattern. A palpable deficiency around the zygomatic buttress signals a midface deficiency. By contrast, an anterior open bite coupled with a known digit-sucking habit strongly points to an etiology rooted in environmental or behavioral factors, rather than a skeletal discrepancy.

69. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Habit-breaker appliances (e.g., thumb cribs, bluegrass appliances) are most effective when used before ingrained habitual behavior becomes structurally entrenched in the occlusion, typically before or around age 12. In addition, younger children have greater growth adaptability, so intercepting harmful forces early can guide normal jaw and tooth development. Once a child nears adolescence, reversing well-established skeletal or dental changes proves increasingly difficult because the growth rate slows. Therefore, the assertion and reason align: earlier intervention with habit-breakers leverages ongoing growth, explaining why they lose effectiveness as skeletal change potential declines with age.

70. (C) Myofunctional therapy or oral physiotherapy exercises

When tongue thrust is the main driver of an anterior open bite in a growing child, conservative treatment options like myofunctional therapy can retrain swallowing and resting tongue posture. This approach reduces the abnormal forward force of the tongue on the incisors. Surgery is rarely indicated for a purely functional habit in an 8-year-old. Fixed orthodontic appliances may be necessary later, but they are not the first line for simple habit correction. Extraction of primary incisors does not address the underlying habitual behavior. Thus, therapy targeting muscle function is the best initial intervention.

71. (B) Posterior-anterior (PA) cephalogram

A posterior-anterior (PA) cephalogram provides a frontal view of the jaws, allowing assessment of maxillary width relative to skeletal and soft-tissue landmarks. This view is particularly beneficial for evaluating transverse discrepancies in the maxilla and mandible. A lateral cephalogram focuses on anteroposterior and vertical relationships, while a panoramic radiograph reveals tooth eruption and general jaw structures but is less useful for precise transverse measurements. A hand-wrist radiograph is used to assess skeletal maturity, not the transverse dimension. Therefore, the PA cephalogram is most relevant for evaluating maxillary width.

72. (C) Hyrax or rapid maxillary expander

A Hyrax or other rapid maxillary expansion appliance is commonly used in the mixed dentition phase to address transverse deficiency and moderate crowding in the upper arch. By opening the mid-palatal suture, it increases maxillary width and often creates additional room to alleviate anterior crowding. A Twin Block targets sagittal discrepancies in Class II cases. The Frankel III appliance is oriented toward Class III modifications. A chin cup resists mandibular growth in skeletal Class III cases. Since this child has minimal skeletal discrepancy but needs space in the anterior region, a rapid expander is more appropriate.

73. (C) Widening of the upper arch to correct crossbites

A deep palatal vault and bilateral posterior crossbites commonly signify that the maxilla is constricted. Rapid or slow expansion can broaden the upper arch, alleviating crossbites by creating adequate transverse dimension. Anteroposterior correction (A) addresses forward/backward jaw relationships, which is not the chief concern here. Increasing vertical facial growth (B) may be a side effect in some expansion approaches but is not the primary goal. Mandibular forward rotation typically depends on vertical alveolar changes, not direct expansion. Thus, the main effect is to widen the maxilla, correcting the crossbite.

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74. (C) Successful arch expansion creating a looser fit

A removable expansion plate is designed to widen the maxillary arch gradually. As the plate guides the suture expansion and teeth move, the appliance can become less snug because it was molded to an earlier, narrower arch form. Breakage or mechanical malfunction would have visible signs, and the child's complaint would likely be about pain or inability to activate. Lack of cooperation usually results in insufficient expansion or no improvement. Therefore, the "loose" feeling typically indicates the plate has successfully widened the arch, making the original acrylic contours slightly oversized.

75. (B) By restricting vertical eruption of upper anterior teeth

An anterior bite plane in a removable appliance keeps the posterior teeth in occlusion while discluding the upper incisors. This reduces the pressure on the upper anterior teeth, often allowing the lower anterior teeth to erupt more or letting the mandible rotate forward slightly, improving a mild Class II and deep bite. It does not involve surgery (A), nor does it mandate primary molar extractions (C). Expansion of the mid-palatal suture (D) is typically managed by a screw device in a specialized expander. Therefore, the bite plane's function is to control vertical eruption of front teeth.

76. (B) Passive space maintainer

Space maintainers serve a passive role in orthodontics: they do not exert active forces for movement but maintain existing space following premature loss of a primary tooth until the permanent successor erupts. Active expansion appliances aim to widen the arch. Functional orthopedic devices, such as Twin Blocks or Frankel appliances, modify jaw growth or posture. A "lingual arch overlay" might be used for anchorage or to maintain arch length, but is typically categorized as a specific type of space maintainer, still falling under the broader umbrella of a passive appliance.

77. (B) Band and loop

A band and loop space maintainer is commonly used when one primary molar is lost in the posterior segment. It uses a band around an adjacent tooth (often the first permanent molar) and a loop spanning the edentulous area, holding space until the permanent tooth emerges. A transpalatal arch and Nance palatal arch are upper arch appliances for bilateral issues. The lip bumper is placed in the lower arch but primarily works by shifting the lower molars distally and not specifically as a simple unilateral space maintainer.

78. (C) It prevents mesial drift of both maxillary first molars

The Nance appliance uses an acrylic button on the anterior palate connected by wires to bands on both maxillary first molars. By anchoring these molars, it maintains space in the upper arch bilaterally, preventing the molars from drifting mesially into the edentulous areas left by prematurely lost primary teeth. It does not restore vertical space, nor is it intended to act as a direct tooth replacement. While there are modifications for expansion, the standard Nance is essentially passive for space maintenance, not an active expansion device, making option (C) the correct statement.

79. (D) Lip bumper for anterior bite correction

While a lip bumper can be used in the lower arch, it typically serves to relieve pressure from the lower lip on the incisors and can help distalize or hold molars, rather than simply preserving a space left by prematurely lost primary teeth. Band and loop is a common unilateral maintainer. A distal shoe guides the eruption of first permanent molars when the second primary molar is lost early. A lower lingual holding arch is a bilateral maintainer. Hence, the lip bumper does not function as a conventional space maintainer.

80. (C) Distal shoe extends subgingivally to guide an unerupted permanent molar

The distal shoe appliance is specifically designed when a primary second molar is lost prematurely, leaving the first permanent molar to erupt without posterior guidance. It features a subgingival extension that serves as a guide plane for the erupting permanent molar's occlusal path. This helps the molar attain its proper position and prevents mesial drift. A band and loop is simpler, residing coronally to maintain space. The distal shoe is not limited to anterior tooth loss, nor is it intended to push molars distally. It can be used in either arch if conditions warrant.

81. (A) Distal shoe appliance

When the primary second molar is lost prematurely before the first permanent molar erupts, the distal shoe appliance is recommended. Its subgingival projection guides the erupting permanent molar into the correct position, preserving the proper occlusal relationship. A band and loop appliance typically requires the first permanent molar to be fully erupted to serve as the anchor. A lingual arch is for bilateral cases when multiple teeth are missing in the lower arch. The Nance arch is a maxillary appliance, making it irrelevant for early primary tooth loss in the lower arch.

82. (C) Lower lingual holding arch

The lower lingual holding arch is designed to maintain space bilaterally in the mandible when primary molars are lost. It connects the first permanent molars on each side via a wire that rests along the lingual surfaces of the lower incisors, preventing mesial drift of the molars. A quad-helix and Nance are typically maxillary appliances, and a distal shoe is usually for unilateral cases when the first permanent molar has not yet erupted. Therefore, a lower lingual holding arch is best for stabilizing space on both sides simultaneously in the lower arch.

83. (C) Band and loop

A band and loop is commonly used to maintain space for a single missing tooth. The design attaches a band on a tooth posterior to the edentulous area (often the erupting permanent first molar) and extends a loop to the tooth anterior to the space, preserving mesiodistal length. A partial denture would be more aesthetic in anterior tooth loss, and the Nance appliance is for the upper arch. A soldered lingual arch might be considered if multiple lower teeth are missing, but for one tooth, a band and loop suffices.

84. (B) To interfere with the child's habitual thumb insertion

Habit breaker appliances, such as a fixed palatal crib or Bluegrass appliance, disrupt the comfortable placement of the thumb in the mouth. This mechanical barrier frustrates the child's attempt to place or rest the thumb against the palate or front teeth, diminishing the habit's frequency over time. Repositioning the mandible forward is more typical of functional jaw orthopedic appliances. While some habit breakers might incidentally reduce tongue thrust, that is not their primary focus. Palatal expansion is a separate process managed by expansion screws or appliances specifically designed to open the mid-palatal suture.

85. (C) It should forcibly lock the tongue in place

A well-designed habit breaker aims to interrupt the digit-sucking habit while minimally interfering with normal oral functions. Smooth edges prevent irritation, while a correct fit still permits normal swallowing and speech production. The appliance typically remains in place for months to ensure the habit is extinguished. However, forcibly locking the tongue is neither standard nor desirable, as it can cause discomfort, hinder natural tongue movements, and potentially lead to other maladaptive behaviors. Thus, an appliance that "locks" the tongue is an incorrect step for fitting a fixed thumb-sucking habit breaker.

86. (A) Complete spontaneous correction of anterior open bite

If the only factor maintaining an anterior open bite is a thumb-sucking habit, discontinuation of that habit often permits normal eruption of anterior teeth and alveolar compensation, leading to spontaneous correction. Worsening overjet usually results if the habit continues, not if it ceases. Surgical intervention is not routinely indicated for habit-induced changes. Habit breakers do not cause permanent speech issues if designed and monitored properly. Therefore, once the habit is removed at an early age, the dentition frequently reverts to a more normal occlusion without extensive orthodontic or surgical interventions.

87. (B) Reduced nasal airflow leading to lower tongue posture and vertical jaw growth

Mouth breathing disrupts the normal balance of orofacial muscle forces by keeping the mouth open, lowering the resting tongue position away from the palate. This lack of muscular support and altered swallowing patterns encourage excessive vertical growth of the alveolar processes, resulting in an elongated facial appearance, often called "long-

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face syndrome." Chronic lip seal (A) is beneficial for normal facial proportions. Early alveolar closure (C) does not typically cause vertical overgrowth. Overly tight anterior facial muscles (D) might affect lip function but are not the main driver of vertical facial elongation in mouth breathers.

88. (C) ENT referral addresses airway obstruction; the oral screen helps retrain oral posture

Adenoid hypertrophy commonly causes obstructed nasal passages, forcing the child to breathe through the mouth, which can alter head and tongue posture. An ENT specialist can evaluate the need for adenoidectomy or other interventions to restore nasal airflow. Concurrently, an oral screen promotes lip seal and encourages proper tongue positioning, guiding the child toward normal swallowing and improved orofacial muscular balance. Antibiotics are used only if infection is present and do not alone solve anatomical obstruction. The oral screen does not reduce enlarged adenoids but complements the medical management by retraining oral posture.

89. (B) Simple mouth breathing syndrome

Simple mouth breathing syndrome occurs when a child predominantly breathes through the mouth due to nasal obstruction or habit, leading to an open-lip posture, downward posture of the tongue, and vertical facial growth. Posterior crossbite commonly emerges from a narrowed maxilla caused by insufficient tongue contact with the palate. Vertical maxillary excess generally involves the maxilla overgrowing downward. Hemifacial microsomia is a congenital defect causing asymmetrical facial structures. True skeletal Class III features an anteroposterior discrepancy rather than a purely vertical or transverse problem. Thus, "simple mouth breathing syndrome" matches the described presentation.

90. (B) Prescribing nasal decongestants and employing a vestibular shield

When mouth breathing is partly due to nasal congestion, decongestants or medical interventions can restore nasal airflow, promoting a closed-mouth posture and reducing vertical overgrowth. A vestibular shield (or lip seal training appliance) encourages lip competence by making lip seal more comfortable and reinforcing nasal breathing. Surgical maxillary impaction (A) and orthognathic surgery (D) are typically reserved for severe skeletal discrepancies in fully grown patients. Extraction of upper incisors (C) neither addresses airway issues nor lip seal. Hence, facilitating normal nasal respiration and lip closure can help minimize the development of a high mandibular plane angle.

91. (B) They rely heavily on patient compliance for effectiveness

Removable appliances must be worn for the recommended duration to achieve the intended tooth movement or growth modification. Because the patient can remove them at will, compliance is crucial. They do not correct severe skeletal discrepancies alone; those often require functional appliances combined with growth or, in severe cases, orthognathic surgery. They can be used in children, adolescents, or adults, depending on the treatment goal. Comparing removable appliances with fixed appliances is context-dependent: each has strengths, and fixed appliances typically provide more precise control for comprehensive tooth movement. Thus, patient cooperation is pivotal for removables.

92. (B) Allergic reaction to acrylic

Although chronic irritation can result from a poorly adapted appliance or incorrect activation, small recurring palatal ulcers might indicate contact allergy to the acrylic component. This possibility should be examined promptly, as continuing exposure could exacerbate the lesions. Improper activation could cause pressure sores, but a consistent pattern of allergic lesions is distinct. Poor tongue posture and excessive jaw growth are not primary causes of local palatal ulceration. Hence, evaluating potential allergic contact dermatitis must be an immediate priority in appliance-induced mucosal irritation.

93. (C) Excessive tooth mobility and pain

When a removable expansion appliance is overactivated, it delivers excessive force to the teeth and alveolar bone, potentially causing discomfort or even pain. Marked tooth mobility is common as the body struggles to adapt to the high forces. A smooth and passive fit suggests correct or insufficient activation, and lingual tipping occurs if the force vector is improperly directed rather than too strong overall. Reduced buccal corridor space is

a subjective aesthetic observation, not necessarily signifying overactivation. Pain and excessive mobility signal that the activation rate or magnitude may be excessive.

94. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

Fixed orthodontic brackets (e.g., preadjusted edgewise systems) incorporate prescriptions for torque, tip, and rotational positioning. When the archwire is engaged, it exerts carefully directed forces on each tooth, enabling precise three-dimensional control over tooth alignment and inclination. This bracket design concept underpins why fixed appliances can correct a wide range of malocclusion complexities more thoroughly than removable appliances. Therefore, the assertion is true—fixed appliances do enable full 3D movement. The reason is also correct, as bracket prescriptions and archwire engagement combine to deliver those controlled forces, explaining the mechanism behind the three-dimensional correction.

95. (A) Hawley retainer with finger springs

A Hawley retainer fitted with finger springs can deliver gentle forces to individual anterior teeth, correcting minor rotations or mild crowding in a growing child. Being removable, it depends on the patient's compliance. A fixed edgewise appliance is more comprehensive for moderate to severe alignment problems. Headgear addresses skeletal discrepancies by restraining or redirecting maxillary growth, primarily used with molar bands. The transpalatal arch is a passive or minimally active appliance for anchorage or slight rotation of posterior teeth, not specifically for anterior tooth rotation.

96. (B) Panoramic radiograph

A panoramic radiograph (OPG) provides a broad overview of the entire dentition, alveolar bone, and jaw structures in one image, making it a practical choice to assess alveolar bone height, root lengths, and any pathology. Bitewings focus on interproximal caries and alveolar crest levels in posterior teeth but do not cover the entire arch well. Occlusal radiographs show a specific segment of the arch, typically used for impacted incisors or supernumeraries. Lateral cephalograms evaluate skeletal relationships and incisor inclinations but are less useful for detailed alveolar bone assessments around multiple teeth.

97. (B) Adequate patient compliance in wear

Removable appliances depend on consistent use to deliver light, continuous forces that guide tooth movement. If the patient wears the appliance sporadically or fails to maintain the recommended hours, tooth alignment may be incomplete or relapse quickly. Overactivation can produce excessive force, causing discomfort or undermining the tooth's stability. A daytime-only regimen might be insufficient, as recommended wear typically involves 20+ hours per day. Premolar extractions are not automatically indicated for minimal crowding. Thus, the cornerstone of removable appliance success here is adherence to the prescribed wear schedule.

98. (C) Easy hygiene and reduced chairside adjustments

Removable appliances can be taken out for cleaning, which helps the patient maintain good oral hygiene. Also, adjusting springs or acrylic can be simpler and often requires fewer in-office changes compared to multi-bracket fixed systems. Rapid expansion of the maxilla typically uses a specialized expansion screw. Fixed appliances allow more precise three-dimensional control over root and crown movements. Overjet elimination depends on the underlying occlusal relationships; a removable appliance targeting spacing does not guarantee overjet changes. Thus, the prime advantage here is convenience and reduced risk of hygiene complications.

99. (B) Reduced ability for bodily tooth movement

Removable spring aligners predominantly tilt teeth rather than performing complex movements like significant bodily translation or root torque. While they can effectively correct mild rotations or small spacing issues, they lack the fine three-dimensional control of fixed appliances. These appliances are often less expensive than multi-bracket systems, root resorption risk is generally lower, and they can indeed correct mild rotations. Hence, the main limitation is an inability to fully control root positioning and bodily movements, making them less versatile for more extensive orthodontic needs.

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100. (B) Trim the acrylic to free the tongue space while retaining the bite block

In a bite plate, acrylic coverage beyond the functional needs of discluding the incisors can impede normal speech by limiting tongue movement. Simply removing the appliance nullifies its corrective role. Full fixed appliances might eventually be indicated, but that does not address the immediate problem of speech impairment in interceptive care. Adding expansion screws is unhelpful for an overbite issue unless a transverse discrepancy is also present. Trimming the acrylic to provide adequate tongue room while preserving the occlusal coverage ensures that the essential deep-bite correction mechanism remains in place.

101. (B) Interceptive orthodontics

Interceptive orthodontics involves timely recognition and elimination of potential malocclusions during the mixed dentition period or early growth phases. The goal is to guide the developing dentition toward a more favorable outcome by removing the cause or modifying growth. For example, correcting a single-tooth anterior crossbite or placing space maintainers can avert more complicated future treatments. Preventive orthodontics focuses on preserving normal development (e.g., prophylactic extractions or sealing fissures). Comprehensive orthodontics typically occurs after most permanent teeth erupt, addressing fully established malocclusion. Surgical orthodontics, in contrast, manages severe skeletal discrepancies often in late adolescence or adulthood.

102. (B) Placement of a band and loop after early loss of a primary molar

Preventive orthodontics aims to maintain normal occlusal development. When a primary molar is lost prematurely, placing a band and loop to preserve arch length keeps the eruption path open for the succeeding permanent tooth. This measure prevents crowding and malocclusion before it can fully form. Extracting an impacted canine at age 15 is a more reactive step, often part of interceptive or comprehensive treatment. Correcting a functional shift addresses an existing developing malocclusion, fitting the interceptive category. Mandibular advancement is an orthopedic or functional measure, typically reserved for modifying an emerging Class II skeletal relationship.

103. (B) Jaw growth can be redirected or modified during active growth phases

Functional appliances (e.g., Twin Blocks, Activator) harness the natural growth potential by guiding the jaws into more favorable relationships. During a child's active growth period, these appliances can alter muscular forces and influence bone remodeling at condylar and sutural sites. Over time, skeletal discrepancies (particularly mild to moderate Class II) may be minimized or resolved. In contrast, the other statements are incorrect: teeth do not erupt in isolation from muscular forces, skeletal patterns can be influenced beyond age 8, and environmental (muscular/functional) factors profoundly affect jaw growth and form.

104. (D) Well-aligned arches except for minimal spacing in incisors

Serial extraction is a planned removal of certain primary and sometimes permanent teeth to guide erupting dentition into a less crowded, more aligned arrangement. It is useful when significant discrepancies exist between tooth size and arch length, or if early crowding suggests future alignment challenges. A Class II skeletal base typically requires functional or orthopedic correction, and serial extraction may be adjunctive if crowding is also present. However, minimal spacing with otherwise well-aligned arches doesn't warrant such an invasive approach. Hence, (D) is the exception among the typical indications for serial extraction.

105. (B) Serial extraction attempts to reduce or eliminate the need for complex appliances later

Serial extraction is a staged approach performed during mixed dentition to guide tooth eruption and minimize severe crowding or malalignment, potentially simplifying or negating the need for extensive braces in adolescence. It involves carefully timed primary and sometimes premolar extractions. In contrast, comprehensive orthodontic treatment generally begins once most or all permanent teeth have erupted, employing fixed appliances or advanced modalities for complete alignment and occlusal optimization. Comprehensive orthodontics does not inherently require surgery; that depends on the case. Final alignment is precisely the goal

of comprehensive treatment, so (B) is the defining difference.

106. (B) Serial extraction plan removing selected primary and possibly premolars

When crowding is moderate (around 4–5 mm) in the mixed dentition and skeletal relations are sound, a serial extraction approach can preempt more severe alignment issues. This strategy usually starts by removing primary canines to relieve anterior crowding, followed by the primary first molars (and possibly first premolars) to guide the permanent canines and incisors into better positions. Immediate extraction of four premolars at age 9 is premature, especially if growth patterns remain favorable. High-pull headgear targets vertical maxillary excess or distalizing the upper molars, and a chin cup is for controlling forward mandibular growth—neither is indicated here.

107. (B) Frenectomy after permanent canines erupt

An enlarged labial frenum can maintain a midline diastema by preventing mesial movement of the central incisors. Orthodontic guidelines advise waiting until the maxillary canines erupt because their eruption naturally helps close anterior spacing. If the diastema persists after canine eruption, a frenectomy can be considered to remove the fibrous attachment and allow or maintain space closure. A palatal crib addresses habits like thumb sucking. Mandibular surgery is irrelevant to a maxillary diastema, and a lingual arch is typically for lower space maintenance. Hence, frenectomy timing is key in diastema management.

108. (B) Correct with a removable appliance (Z-spring or inclined plane)

An anterior crossbite in a single tooth can lead to abnormal occlusal wear and potential gingival trauma if left unaddressed. When there is no skeletal disharmony, a simple removable appliance—like a removable plate with Z-springs or a small inclined plane—can tip the affected incisor into the correct position. Waiting until more permanent incisors erupt could compound the malocclusion. A chin cup is used for mandibular growth restraint in skeletal Class III cases, which does not apply here. Extraction of the lower incisor is extreme and typically reserved for severe crowding.

109. (B) Promote mandibular forward posturing

Functional appliances such as the Twin Block encourage the mandible to posture forward, harnessing the child's natural growth potential to enhance mandibular length and correct a mild skeletal Class II relationship. By positioning the lower jaw forward, it stimulates condylar growth and remodels the glenoid fossa. This changes the jaw relationship over time, often complemented by tooth movement. Torqueing upper incisors lingually can be accomplished with fixed mechanics. Functional appliances do not primarily focus on single-tooth eruption control or maintaining arch space—those would be roles of interceptive or space-maintaining devices, respectively.

110. (D) Placing the upper block entirely on the lower arch for crossbite cases

A Twin Block is a bimaxillary removable appliance with separate upper and lower acrylic bite blocks that guide the jaws into a desired relationship. The upper block is fitted to the maxilla, and the lower block is fitted to the mandible. The correct procedure includes capturing a forward mandibular position in the construction bite, ensuring posterior teeth do not occlude initially, and adjusting acrylic coverage to open the bite enough for functional posturing. Transferring the upper block to the lower arch is never a standard practice, so that step is incorrect.

111. (B) Development of asymmetric mandibular growth

A functional shift occurs when occlusal interferences cause the mandible to deviate laterally during closure, leading to a unilateral crossbite. If persistent, this can direct growth asymmetrically, potentially resulting in facial asymmetry over time. Unilateral crossbites rarely self-correct if a significant shift is present. Midfacial growth might be unaffected directly, while permanent teeth do not exfoliate prematurely from this problem. Without intervention, the probable outcome is an increasingly pronounced asymmetry, as the condylar growth patterns and neuromuscular adaptation reinforce the lateral shift.

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112. (C) Anterior open bite

A tongue thrust habit involves forward placement of the tongue between the anterior teeth during swallowing and sometimes at rest. Over time, this habit exerts pressure that inhibits vertical eruption of anterior teeth, facilitating or maintaining an open bite. The habit typically proclines (not retroclines) the upper incisors, often increasing overjet if paired with other factors. It does not reduce overjet nor drive horizontal overlap of lower incisors forward. Hence, chronic forward thrusting typically manifests in an anterior open bite, confirming (C) as the main cause-and-effect result of tongue thrusting.

113. (C) It physically blocks the thumb from resting between the incisors

A fixed palatal crib is designed as a habit-breaker, preventing the thumb from positioning behind the front teeth and maintaining an open bite. The appliance has metal projections or a small "crib" that spans the palatal vault, effectively blocking or deterring the child from inserting the thumb or digit in the usual spot. Once the habit is disrupted, normal eruption of anterior teeth can occur, helping close the open bite. It does not restrict lower jaw growth or expand the palatal suture (specialized expansion appliances do that). Nor does it deliberately push the tongue into the incisor region.

114. (A) Dental crossbite

When only a single or few anterior teeth are malposed while skeletal jaw bases remain normal, it typically indicates a dental crossbite. A functional shift refers more commonly to posterior crossbites with a mandibular deviation, and skeletal Class III would show a more generalized anteroposterior discrepancy. Bilateral crossbite describes involvement of both sides or multiple teeth. Since the molar relationship is normal and only one incisor is in crossbite, this points to a localized dental cause rather than a skeletal or functional issue, confirming a dental crossbite.

115. (A) Palatal expansion using a fixed expander

Moderate space deficiency in the upper arch often responds well to palatal expansion if skeletal growth remains favorable. By widening the maxilla (particularly in the mixed dentition), more arch perimeter becomes available, potentially obviating the need for permanent tooth extractions. Extraction of first premolars is a more definitive approach when expansion or other methods cannot solve significant crowding. A lower lingual holding arch is for the mandibular arch, not the maxilla. Extracting upper primary incisors does not address posterior deficiency and can cause undesirable spacing changes. Fixed expansion is thus the best interceptive step.

116. (C) Gagging sensation and excessive drooling

Overextension of a removable appliance may encroach too far into the soft palate or across gingival margins, provoking a gag reflex and making normal swallowing or speech difficult. Excessive drooling can occur because the child cannot swallow saliva efficiently when posterior acrylic edges are too long or intrude on the soft palate area. Mild pressure on alveolar ridges is expected if forces are correctly directed. Clear speech articulation and stable coverage without discomfort suggest proper adaptation. Thus, gagging and drooling are key clinical signs that the appliance might require trimming or repositioning.

117. (A) Both Assertion and Reason are true, and Reason is the correct explanation.

A single-tooth anterior crossbite often forces an abnormal occlusal relationship. The lower incisor can abut or impinge on the palatal gingiva, causing gingival recession or tooth wear. Correcting this crossbite early alleviates such trauma and prevents compensatory changes like incisal chipping or abnormal wear facets. Both the assertion and reason hold true, and the reason clarifies why an untreated anterior crossbite leads to tissue damage and occlusal harm. Hence, aligning the incisors not only restores functional contact but also avoids potential periodontal or tooth-structure damage, making early correction beneficial.

118. (B) Chin cup

A chin cup is traditionally used to exert a backward and upward force on the mandible, aiming to redirect or restrain excessive mandibular growth in mild skeletal Class III cases. Frankel II is typically indicated for Class II correction by stimulating mandibular advancement. Headgear to the upper molars restricts maxillary forward growth or

distalizes upper teeth, more applicable to a Class II scenario. A rapid maxillary expander targets transverse maxillary deficiencies, not a forward mandibular posture. While the effectiveness of chin cups can be variable, it remains a recognized method for managing mild Class III tendencies in growing patients.

119. (A) SNA angle

SNA measures the anteroposterior position of the maxilla relative to the cranial base (Sella-Nasion plane). In skeletal Class III malocclusions associated with maxillary retrusion, the SNA angle is often reduced compared to normal values, indicating a deficient maxilla. SNB angle evaluates mandibular anteroposterior position, while the Frankfort–mandibular plane angle (FMA) relates vertical jaw relationships. The interincisal angle measures the relationship between upper and lower incisors, not the maxilla's position. Therefore, a diminished SNA angle is a key indicator to confirm maxillary deficiency, guiding the decision to utilize a protraction facemask.

120. (B) Palatal expander

When protraction facemask therapy is used to address maxillary retrusion in a growing child, it's often combined with a palatal expander. By opening the mid-palatal suture, the maxilla becomes more mobile, allowing forward orthopedic forces from the facemask to act effectively. The chin cup (A) is for managing mandibular growth, not maxillary advancement. Fixed edgewise brackets (C) may refine tooth alignment but are not specifically used to enhance maxillary protraction. A tongue crib (D) addresses tongue or digit habits. Hence, expansion plus facemask synergy promotes greater skeletal change in Class III cases.

121. (C) Patent mid-palatal suture and adaptive sutural growth

In young patients, the mid-palatal suture remains open, permitting transverse expansion of the maxilla via rapid maxillary expansion. This expansion loosens or disarticulates maxillary sutures, making the upper jaw more susceptible to forward orthopedic forces applied by the facemask. As a result, the child's anterior crossbite and facial profile often improve significantly. Adult suture fusion limits such orthopedic changes, and condylar remodeling primarily affects the mandible. Extracting lower incisors does not address maxillary retrusion. Thus, harnessing growth potential with the mid-palatal suture still patent is crucial for facemask therapy success at age 10.

122. (B) Increased SNB angle

The SNB angle directly assesses the anteroposterior position of the mandible relative to the cranial base. An elevated SNB (above normal ranges) indicates that the mandible itself is forward-positioned, reinforcing a skeletal Class III relationship. A reduced SNA angle implies a retrusive maxilla, which is a different cause of Class III. The interincisal angle measures incisor inclination rather than jaw relationship. The Frankfort–mandibular plane angle (FMA) mainly reflects vertical growth tendencies. Therefore, an increased SNB angle confirms genuine mandibular prognathism rather than purely dental inclination or compensation.

123. (B) Chin cup therapy

The patient's near-normal SNA angle and borderline increased SNB angle suggest mild mandibular prognathism rather than maxillary retrusion. Given that the negative overjet is gradually worsening, an approach to limit or redirect further mandibular growth is indicated during adolescence, provided growth remains ongoing. A chin cup applies a backward and upward force on the mandible, potentially slowing forward growth. Facial mask therapy with expansion targets maxillary deficiency. High-pull headgear restrains vertical maxillary growth in Class II or vertical excess cases. A surgical mandibular setback is typically reserved for severe discrepancies after growth completion, making chin cup therapy appropriate now.

124. (C) Six occlusal features that define an ideal Class I occlusion

Andrews' Six Keys to Normal Occlusion outline a set of criteria for optimal tooth alignment and occlusal relationships, primarily describing tooth angulation, inclination, rotations, contact points, curve of Spee, and the correct Class I molar relationship. They establish a conceptual standard for finishing orthodontic cases in a stable and functionally harmonious occlusion. While Andrews

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also pioneered bracket prescriptions (the straight-wire appliance), the "Six Keys" themselves focus on describing the occlusal outcome, not bracket design. They do not exclusively pertain to removable retainer fabrication or torque prescriptions limited to premolars.

125. (D) Intentional incisal spacing

Andrews' Six Keys to Normal Occlusion encompass: (1) Correct molar relationship, (2) Proper crown angulation (mesiodistal tip), (3) Proper crown inclination (labiolingual torque), (4) No rotations, (5) Tight contacts, and (6) A flat or slight curve of Spee. Intentional incisal spacing is not part of this ideal standard; rather, the concept emphasizes closed contacts with no interdental spaces, as proper contact relationships promote stability and function. Hence, "intentional incisal spacing" is not one of the Six Keys, making it the correct answer to this negative/exception-based question.

126. (A) Suture adaptation and alveolar remodeling can increase arch circumference

Expansion appliances like rapid or slow maxillary expanders work by separating the mid-palatal suture (in growing patients) and inducing alveolar bone remodeling. This process widens the transverse dimension of the upper arch, thereby increasing overall arch circumference to accommodate teeth more comfortably. After suture closure in late adolescence or adulthood, skeletal expansion becomes more challenging. Although palatal expansion can impact facial height to some degree, its primary effect is transverse width, not specifically reducing mandibular plane angle. Both bone and soft tissues adapt during orthodontic interventions, not just soft tissues.

127. (D) Lower anterior facial height decrease

Rapid maxillary expansion often opens the mid-palatal suture, creating a space that may present as a transient midline diastema between the maxillary incisors. Posterior teeth commonly tip buccally, and the force can displace the maxilla slightly upward and forward. However, RME does not typically decrease lower anterior facial height; in some cases, it may slightly increase it due to changes in the vertical dimension or a slight downward rotation of the mandible. Therefore, a reduction in lower anterior facial height is the least likely effect among the listed possibilities.

128. (C) Slow expansion may induce more alveolar bending than pure suture separation

Slow expansion protocols typically use smaller daily activation forces, spread over weeks or months. This prolonged application fosters both dental and alveolar bone adaptation and can minimize dramatic suture separation, instead promoting alveolar bending and cortical remodeling. Rapid expansion, on the other hand, usually involves turning the screw one to two times per day, achieving significant separation of the mid-palatal suture in a short time—often indicated for growing children or early adolescents, not solely for adults. Retention is crucial in both methods to stabilize the newly expanded arch. Thus, (C) is the key contrasting feature.

129. (B) Rapid maxillary expansion using a bonded expander

When moderate crowding and a constricted maxilla coincide, a rapid maxillary expansion appliance—often bonded to posterior teeth—can achieve significant transverse skeletal expansion quickly, generally within two to three weeks. This method uses high forces to split the mid-palatal suture in a growing child, creating more arch perimeter. Slow expansion with a removable plate can be effective but is less powerful for skeletal change. Interproximal enamel reduction may address only minor crowding. Extracting primary canines can relieve mild anterior crowding but does not sufficiently expand the maxillary arch for moderate crowding.

130. (C) Emphasizing at least 14–16 hours of daily wear and scheduling frequent reviews

Removable expansion appliances require consistent wear for effective outcomes. Typically, 14–16 hours daily is recommended, often including night-time and after-school hours. Frequent follow-up helps monitor progress, motivates the child, and addresses potential comfort or speech issues. Wearing the appliance for just one hour or merely overnight is insufficient to produce stable expansion. A high-pull headgear is meant to control maxillary or vertical growth, not specifically to correct a mild transverse

deficiency. Thus, reinforcing proper wear time and active oversight is the most direct method to boost compliance and success rates.

131. (B) Convert the expander to a holding appliance for retention

Once the mid-palatal suture is separated and the desired transverse dimension is achieved, the expanded arch must be stabilized to allow new bone formation. Typically, the expansion appliance is locked or left in place for several months (3–6 months) in a passive mode for retention. Abrupt removal without retention can lead to relapse as the tissues rebound. Bilateral premolar extractions are not automatically required unless there is severe crowding. Extended absence of orthodontic follow-up invites relapse or other complications. Hence, retaining the expansion is essential to maintain gains.

132. (B) Finger springs adjusted to the correct angulation

In a removable orthodontic appliance, finger springs (or similar active components) deliver the targeted force to specific teeth. Proper angulation and activation of these springs ensure that force is directed in the intended vector (e.g., labially to correct a rotated incisor). Acrylic coverage, hooks for elastics, or a bite plane might serve other functions (retention, anchorage, disclusion), but they do not determine the precise direction of tooth movement. Correctly adjusted finger springs are crucial for controlled, efficient movement—too little or misdirected force leads to inadequate or undesired tooth movements.

133. (D) Stop wearing it at night if mild discomfort is felt

An expansion plate, especially one with an active screw, requires consistent, often near-continuous usage to achieve gradual arch widening. Mild discomfort after activation is relatively common as tissues adapt, and removing the appliance at night undermines the forces needed for effective expansion. Patients are advised to maintain the appliance in situ as instructed, removing it primarily for meals or cleaning. Following the dentist's activation schedule is critical, as is daily recommended wear time. Encouraging discontinuation during night-time use due to mild discomfort is an incorrect directive that could compromise treatment progress.

134. (C) An 8-year-old with traumatic deep bite and lower incisors impinging on palatal mucosa

An anterior bite plate discludes the posterior teeth, allowing them to erupt while reducing excessive overlap of anterior teeth. Children with deep bites, especially those experiencing palatal trauma from lower incisors, frequently respond well. A normal overbite or a severe posterior open bite does not need an appliance that increases posterior eruption. Surgical Class III corrections typically involve skeletal discrepancies beyond simple bite-plane solutions. Thus, an 8-year-old presenting with deep incisal overlap and palatal impingement is most likely to benefit from an anterior bite plate to alleviate the traumatic overbite.

135. (C) Prevention of vertical eruption of posterior teeth, opening the bite

Posterior bite blocks keep the upper and lower molars separated, inhibiting their normal vertical eruption. As a result, the mandible can autorotate upward and forward, effectively reducing the overbite and opening the bite anteriorly. Incisal wear might be reduced if the incisal edges are discluded. Typically, holding posterior teeth out of occlusion encourages the alveolar processes around the incisors to erupt or adapt, leveling or reducing a deep bite. The process does not compress the condyle in a way that decreases overall facial height; rather, it can help control or reduce vertical facial dimension if properly managed.

136. (B) It encourages lower incisor eruption by discluding the posterior teeth

Anterior bite planes separate the back teeth, eliminating occlusal contacts that normally limit vertical eruption. When the posterior teeth are discluded, the lower incisors can erupt further, reducing excessive overbite. This mechanism doesn't rely on pushing the maxilla forward nor flattening incisal edges. Condylar neck elongation involves skeletal factors not directly addressed by a bite plane. Instead, the plane positions the lower arch such that the posterior teeth have minimal contact, permitting the lower incisors to move occlusally, thus reducing palatal impingement. This controlled

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eruption effectively alleviates the traumatic deep bite seen in the child.

137. (B) Ability to guide the mandible back into an incisal overlap with gentle manipulation

A pseudo-Class III (or functional Class III) arises when a forward shift of the mandible is adopted to achieve occlusion, often because of an incisal interference. The key clinical hallmark is that gentle manipulation of the jaw can seat the condyle more posteriorly, revealing a normal incisal relationship. True skeletal Class III shows an inherent bony discrepancy that cannot be easily "guided" away. Parental prognathism or an elevated SNB angle indicates skeletal involvement. A Class III molar relationship in centric occlusion might still exist, but the definitive sign is the manipulative correction.

138. (B) Removable appliance to eliminate incisal interference and guide the mandible back

Pseudo-Class III malocclusion involves a forward functional shift of the mandible due to occlusal interferences, not an inherent skeletal jaw discrepancy. A removable appliance (sometimes with an inclined plane or acrylic platform) can eliminate the interference, allowing the mandible to posture normally. Surgical advancement is unnecessary for a functional shift without a skeletal deficiency. Chin cup therapy aims to restrain mandibular growth in genuine skeletal Class III. Distalizing lower molars with headgear is an uncommon approach because the problem lies in the forward shift, not purely mesially drifted lower dentition.

139. (B) An 8-year-old with 10 mm overjet, retrusive mandible, and incompetent lips

Class II features like a large overjet (≥8–10 mm) combined with lip incompetence and mandibular retrusion typically warrant earlier intervention, especially if growth can be harnessed to improve jaw relationships. Identifying these issues around 8–10 years allows functional appliance therapy (e.g., Twin Block) to potentially correct or lessen the skeletal discrepancy. A 5-year-old still in full primary dentition is often too early for Class II orthopedics unless severe functional problems arise. A 16-year-old with mild crowding doesn't represent early interceptive needs, nor does a 12-year-old with a near-perfect occlusion and minimal rotation.

140. (C) Multiple unerupted permanent teeth with abnormal crown shapes

Syndromic or developmental conditions (e.g., Cleidocranial dysplasia, ectodermal dysplasia) often present with multiple impacted or unerupted teeth and atypical tooth morphology. Minor spacing and missing third molars are relatively common findings. Early exfoliation of some primary teeth can happen but is not exclusively syndromic. If multiple permanent teeth remain unerupted beyond their normal eruption windows and appear radiographically deformed or are accompanied by supernumeraries, a genetic or syndromic etiology is highly suspect. Therefore, abnormal crown shapes with widespread failure of eruption is the key red-flag scenario.

141. (B) Eruption of posterior teeth decreasing overbite

Functional appliances used to correct a deep bite often disclude posterior teeth, encouraging them to erupt and leveling the occlusal plane. This process diminishes vertical overlap in the anterior region over time. If lower incisor eruption worsened or alveolar bone became pathologically thin, it would signal complications rather than improvement. A shift from Class I to Class II indicates an undesirable anteroposterior change. Therefore, the hallmark sign of improvement for a deep bite scenario under functional therapy is increased posterior tooth eruption leading to a reduction in overbite.

142. (C) Assertion is true, Reason is false.

Removable functional appliances do address moderate Class II skeletal issues by encouraging the mandible to posture forward, stimulating condylar growth and altering muscle function over time. The assertion is correct because these appliances can significantly improve anteroposterior jaw relationships in a growing child. However, the reason is false because the jaw is not "permanently repositioned within weeks." True skeletal adaptation occurs gradually over several months or years, relying on consistent appliance wear, growth, and remodeling at the condyle and glenoid fossa. A forward posture eventually can become stable, but it certainly does not happen in mere weeks.

143. (C) It is a fixed expander for transverse arch development

A quad-helix is a fixed appliance anchored to the maxillary molars. Its helices and arms can be expanded or adjusted to apply lateral forces, widening the posterior segments of the arch and correcting posterior crossbites. It is not a removable plate, nor does it address Class II skeletal issues or limit posterior eruption. Instead, it is primarily used to achieve transverse expansion or rotation of certain teeth. Anterior traction on the maxilla is provided by protraction headgear or facemask, not a quad-helix. Hence, (C) accurately describes its function.

144. (A) Lateral cephalogram

A lateral cephalogram is ideal for evaluating the vertical dimension of occlusion, including the eruption level of posterior teeth, relative jaw planes, and angles. Although a panoramic radiograph provides a broad overview of all teeth, it's less reliable for precise vertical measurements because of image distortion. A posterior-anterior cephalogram mainly helps evaluate transverse relationships and facial symmetry. An upper standard occlusal view focuses on the maxillary arch occlusal detail but lacks vertical references for skeletal analysis. Consequently, the lateral cephalogram is best for assessing vertical eruptions in the context of posterior bite plates.

145. (D) CBCT or maxillary occlusal radiograph

To evaluate the patency of the mid-palatal suture, advanced imaging such as CBCT (Cone Beam Computed Tomography) can visually confirm the extent of suture fusion or interdigitation. Alternatively, a specialized maxillary occlusal radiograph might demonstrate the palatal suture region in younger patients. Panoramic radiographs are less specific for suture detail. Hand-wrist radiographs assess skeletal maturity but do not directly reveal suture condition. A posterior-anterior cephalogram can show transverse jaw relationships but offers limited resolution of the palatal suture itself. Thus, CBCT or a specific occlusal radiograph is the best confirmatory step.

146. (B) Poor appliance wear compliance

Slow maxillary expansion via a removable plate relies on consistent patient compliance, typically requiring near-full-time wear except during meals or sports. If the child does not follow the prescribed regimen, the delivered forces become intermittent or insufficient, leading to minimal skeletal or dental changes. Excessive activation force typically leads to discomfort and potential tissue injury, not slow or insufficient change. Overextended acrylic might affect comfort, but the main culprit for minimal improvement is usually non-compliance. Early appliance removal after 2 months was not indicated in the vignette, making poor wear the prime issue.

147. (A) Patient's growth potential and compliance

Functional appliances like the Twin Block depend on both adequate residual mandibular growth and consistent use by the patient. During peak adolescence or near the pubertal growth spurt, the mandible can respond favorably if the patient wears the appliance as instructed (often 18–20 hours daily). Extraction of second premolars or headgear may be adjuncts in certain cases but are not universally required. Switching to full fixed appliances prematurely might disrupt the functional correction process. Consequently, harnessing the remaining growth while ensuring compliance is the prime determinant of effective Class II orthopedic changes.

148. (C) Reinforce compliance and refit the functional appliance if necessary

Functional appliances rely heavily on regular wear, especially during the growth spurt, when skeletal changes are most pronounced. Inconsistent use partially explains why the overjet remains only partially corrected. Rather than abandoning functional therapy or prematurely transitioning to fixed appliances, it's often best to re-motivate the patient, ensure a proper fit (possibly making a new appliance or adjusting the old one), and optimize compliance. Growth modification is still achievable if the patient rigorously follows instructions. Jaw surgery is usually postponed until skeletal maturity and is unwarranted if good growth potential remains for a modest Class II correction.

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149. (B) Prevent relapse by maintaining teeth in their corrected positions

Retention follows active orthodontic treatment to stabilize newly positioned teeth, allowing periodontal and supporting tissues time to remodel. This prevents them from drifting back toward their original malaligned positions. Retainers do not typically induce additional tooth movement. While TMJ assessment can be part of post-treatment evaluations, it is not the function of a retainer. Likewise, any significant arch widening should be completed before retention begins. Thus, the fundamental purpose of a retention appliance is to hold the corrected alignment, minimizing relapse risks until tissues stabilize.

150. (A) Hawley retainer

A Hawley retainer is a classic removable retention device with an acrylic base (covering part of the palate in the maxilla) and a labial bow that contacts the anterior teeth. It can also incorporate optional clasps and springs for minor adjustments. An Essix retainer is a clear, vacuum-formed appliance that completely covers the crowns of the teeth. A fixed lingual retainer is bonded to the lingual surfaces of anterior teeth and is not removable. The positioner appliance is used for minor finishing movements or retention but encloses both arches in a bulky design.

151. (B) To provide specific tip, torque, and in–out values

Bracket prescriptions in fixed appliances define the built-in angulation (tip), inclination (torque), and offset (in–out) for each tooth type. The Roth or MBT prescriptions alter the bracket's slot design so that, when a straight archwire is placed, teeth can be guided into ideal positions without extensive wire bending. This standardization ensures more consistent results in axial alignment, helping correct malocclusion precisely. Ligature colors are a cosmetic choice and do not change the prescription. Choice of metal or ceramic materials concerns esthetics and patient preference, while the archwire size is selected separately based on treatment stage.

152. (C) Slot or channel

In a fixed orthodontic bracket, the slot (also called the channel) is the critical component through which the archwire passes. When the wire is engaged and ligated, it exerts forces on the bracket, transferring movement to the tooth via the bracket base (bonded or banded to the tooth). The tie-wings are the small tabs on which elastics or ligatures hold the wire in place. A hook extension is often present on brackets for attaching elastics, but it is not the main location for the archwire. The mesh base ensures adhesion to the tooth surface.

153. (B) They incorporate ideal tip, torque, and rotation in the bracket design

Preadjusted edgewise systems (e.g., Straight-Wire appliances) are designed so each bracket has built-in specifications (tip, torque, and rotation) for a specific tooth. By placing an appropriately contoured archwire, the brackets apply a pre-programmed force and move each tooth toward its intended final position. This reduces the orthodontist's need to manually bend the wire for individual tooth angulation or inclination. Rectangular wires are often used, but bracket prescriptions rather than wire shape alone minimize detailed bends. Treatment still requires progressive archwire changes, but fewer complex adjustments are needed due to the built-in bracket design.

154. (D) Aluminum-copper alloy

Common wire materials in orthodontics include stainless steel, nickel-titanium (NiTi), and beta-titanium (also called titanium-molybdenum alloy, TMA). Stainless steel wires are known for strength and formability, NiTi wires provide shape memory and superelastic properties, and beta-titanium wires offer a balance of flexibility and stiffness. Aluminum-copper alloys are not standard or routinely used in orthodontic archwires. Orthodontists prefer materials with consistent mechanical properties, good resilience, and corrosion resistance within the oral environment, which aluminum-copper alloys do not typically provide. Hence, (D) is the exception among common wire materials.

155. (B) NiTi wires have shape memory and superelasticity, while stainless steel does not

Nickel-titanium wires exhibit shape memory and superelastic behavior. When deformed, they can return to their original shape once heated to oral temperatures, making them ideal for initial alignment because of gentle, continuous forces. Stainless steel

wires, in contrast, lack these superelastic properties but are strong and can be bent or soldered accurately for detailed adjustments. NiTi's elasticity surpasses that of stainless steel, allowing it to deliver forces over a longer range of activation. Therefore, the fundamental distinction is that NiTi wires provide shape memory and superelastic features, whereas stainless steel does not.

156. (B) Nickel-titanium round wire

During the initial alignment phase, a flexible archwire that can gently de-rotate and level the teeth is ideal. Nickel-titanium (NiTi) round wires excel in this role because of their superelastic properties and shape memory, providing continuous light forces even in severely crowded arches. Heavy rectangular stainless-steel wires are more appropriate in later stages, once teeth are aligned and more rigid control of torque and tip is required. Beta-titanium can be used for finishing or intermediate stages, providing more control than NiTi but less stiffness than stainless steel. Gold archwires are rarely used in contemporary practice.

157. (B) Heavy rectangular cross-section for bodily tooth movement

When closing extraction spaces, achieving bodily movement of the teeth (rather than just tipping) is crucial. A heavier rectangular archwire can engage the bracket slot with more precise control over tooth angulation and torque, applying forces that ensure controlled root movement. Very flexible round wires might allow tipping instead of translation, risking unwanted tooth orientation. While coil springs and other auxiliaries help with force delivery, the wire's stiffness and shape significantly influence how the tooth moves in the bracket. Hence, a robust rectangular wire is typically employed during the space closure stage.

158. (C) Beta-titanium (TMA) rectangular wire

In the finishing phase, small but precise tooth movements (fine-tuning of torque, tip, or angulation) are needed. Beta-titanium (TMA) wires balance flexibility and stiffness, allowing the orthodontist to place subtle bends and adjustments while delivering gentle forces. Nickel-titanium's superelasticity is better for early alignment, and large diameter round steel wires may not provide the torque control necessary for finishing. Braided or multistranded wires are sometimes used for alignment or retention but are less commonly chosen for detailing complex movements. Thus, TMA rectangular wires are typically favored for final, precise adjustments.

159. (C) Deliver continuous elastic traction to close spaces

A power chain is a series of connected elastic modules designed to apply a continuous tensile force across teeth, commonly used for closing small gaps or holding teeth tightly together once spaces have been reduced. They exert a sustained pull that can approximate adjacent teeth, especially effective in extraction space closure or diastema management. Power chains do not typically serve as passive devices or anchorage providers. While they can influence tooth rotation secondarily, their principal function is to pull teeth along the archwire, facilitating space closure or minimizing gaps.

160. (D) Leaving the chain in place for the entire treatment with no change

Power chains lose elasticity over time and must be replaced periodically for consistent force application. Correct steps include cleaning the bracket area, ensuring plaque is minimal, and hooking the chain properly from bracket to bracket to apply tension. As the elastic modules fatigue, they exert less force, hence regular replacement keeps space closure efficient and controlled. Leaving the same chain indefinitely can lead to insufficient or uncontrolled tooth movement, plaque accumulation, and potential damage to brackets or tissue. Therefore, option (D) is the incorrect protocol among otherwise proper steps.

161. (C) Orthodontic hook or bracket hook

Intermaxillary elastics (e.g., Class II or Class III elastics) attach between upper and lower arches, often connecting from a hook on the upper bracket (or archwire) to a hook on the lower bracket (or vice versa). A bracket hook is the specific accessory to which elastics are secured. Bracket slots are for archwire placement, not for inter-arch elastics. Elastic separators are short-term devices for creating space between teeth prior to banding. Powerchains connect teeth within the same arch for space closure,

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not across arches. Hooks thus facilitate these cross-arch elastic attachments.

162. (A) Old elastics lose elasticity, reducing consistent force

Elastics, whether for space closure or intermaxillary corrections, rely on their elastic rebound to generate a steady force. Over time, especially if worn long beyond their intended duration, these modules lose tension. In effect, the orthodontic force diminishes significantly, and tooth movement stalls, so spacing remains. The idea that old elastics spontaneously tighten or that brackets detach from reused elastics is unfounded. Archwires rarely break from changing elastics frequently. Therefore, the patient's lack of progress results from diminished elastic tension caused by not replacing them as directed, underscoring the importance of compliance.

163. (A) Nance palatal button

The Nance appliance, featuring an acrylic button on the palate connected by bands on the maxillary molars, helps prevent the molars from drifting mesially. It effectively reinforces posterior anchorage when retracting anterior teeth. An anterior bite plane is primarily for deep-bite correction. A lip bumper is used on the mandibular arch to relieve lower incisor pressure and can distalize lower molars but does not address maxillary anchor units. A simple transpalatal arch (TPA) provides some stabilization, but a Nance with an acrylic button typically offers a stronger anchorage effect in preventing forward molar movement.

164. (A) Anchorage loss in the anterior segment

When Class II elastics are used extensively, the lower arch exerts a forward pull on the upper arch. If the anterior teeth in the maxilla lack adequate anchorage, they can tip labially, manifesting as flared incisors. This phenomenon is known as anterior anchorage loss—an unintended consequence of elastics if posterior anchorage is insufficient. A posterior open bite would indicate vertical discrepancies, not flared incisors. Reverse curve of Spee references a particular occlusal curve issue, and a true skeletal Class II would be a structural jaw relationship, rather than just tooth movement.

165. (B) Micro-implant or temporary anchorage device (TAD)

Temporary anchorage devices (TADs), also known as micro-implants or mini-screws, can be placed in the alveolar bone to provide stable anchorage. Orthodontists can apply distalizing forces to the upper molars without relying on reciprocal tooth movement that would compromise anterior segments. Consequently, this can create additional arch space for crowded incisors. Elastics from anterior to lower brackets would risk flaring incisors. Gingivoplasty deals with soft tissues, not tooth positioning. A posterior bite block is mainly used for vertical control in deep-bite cases. Thus, TAD-based distalization offers a non-extraction solution.

166. (C) Routine prophylactic removal is not universally recommended

Research suggests no definitive link that impacted third molars directly cause anterior crowding. While some orthodontists historically recommended prophylactic wisdom tooth extractions to maintain lower incisor alignment, current evidence does not uniformly support that practice. Instead, clinicians assess each patient individually, considering factors like pathology, potential for infection, or orthodontic necessity. Removing third molars preemptively does not guarantee freedom from late lower incisor crowding, which can occur due to multifactorial reasons including growth, muscular pressures, and natural changes in arch form. Thus, blanket prophylactic extraction without clear indications is not routinely endorsed.

167. (B) Excessively high orthodontic forces or genetic predisposition

Significant or generalized root resorption beyond mild rounding of roots may signal either overly forceful or prolonged orthodontic loads, or a genetic predisposition making certain individuals more susceptible to root shortening. While mouth breathing, bracket bonding, and plaque control each influence treatment success, they're not prime causes of abrupt or widespread root resorption. Improper force management can overstress the periodontal ligament and alveolar bone, leading to abnormal root remodeling. Additionally, some patients genetically exhibit heightened root resorption responses to routine forces. Therefore, investigating force levels

and individual predisposition is the critical step in such cases.

168. (B) Food entrapment and localized gingival inflammation

A loose orthodontic band on a molar or premolar can create a gap between the band and the tooth surface. Food debris and bacteria often lodge underneath, causing localized gingival redness and inflammation, sometimes accompanied by bad breath. Sudden improvement in tooth rotation or excessive torque on anterior brackets aren't typical indicators of a posterior band issue. Discolored modules usually relate to dietary staining. Thus, persistent food trapping and gingival irritation specifically around a banded tooth is a clear sign that the band's seal is compromised and needs refitting or replacement.

169. (C) Assertion is true, Reason is false.

Sometimes in pediatric or compromised posterior teeth, stainless-steel crowns can serve as a robust alternative to traditional bands, providing a reliable surface for bracket or tube attachment. This is especially helpful if the tooth structure is insufficient for a band or has been restored extensively. The reason given— "reduces the tooth's vertical dimension"—is not correct. A stainless-steel crown does not deliberately reduce vertical dimension; it replaces missing tooth structure while maintaining functional height. Therefore, although the assertion is correct, the reason is unrelated to the fundamental rationale for using stainless-steel crowns as band substitutes.

170. (B) Lightly sandblasting the restoration surface prior to bonding

When a tooth is heavily restored, bracket adhesion can be compromised due to the smooth or incompatible surface. Lightly sandblasting or roughening the restoration surface (composite or porcelain) increases mechanical retention. Glass ionomer cements are less commonly used for bonding orthodontic brackets on permanent restorations, as resin-modified or conventional resin adhesives generally perform better. Placing a full-coverage crown purely to hold an orthodontic bracket is excessive unless the tooth needs it for structural reasons. Solely depending on chemical bonding can fail if the surface is not properly prepared; mechanical retention from sandblasting is usually more reliable.

171. (A) Bitewing radiograph

Bitewing radiographs provide a high-resolution view of the interproximal areas around the crowns of posterior teeth, including the alveolar crest. They are ideal for checking whether bands impinge on or are excessively close to the crestal bone, which could provoke periodontal issues. Panoramic radiographs give an overall jaw overview, but fine detail around the alveolar crest can be limited. Lateral cephalograms show skeletal relationships from the side, while occlusal radiographs capture the arch form from a top or bottom view. Therefore, bitewings are superior for precise band-to-bone proximity analysis.

172. (B) Archwire

When patients complain of a sharp or poking sensation at the back of the mouth, the distal end of the archwire is commonly at fault. As teeth move during orthodontic treatment, the wire may shift out of the molar tube, protruding into soft tissues and causing discomfort or ulceration. Powerchains and hooks can irritate other areas, but the distal extension typically points to archwire overhang. The Nance button sits on the palate and is less likely to cause posterior cheek irritation. Therefore, trimming the archwire end resolves the primary cause.

173. (A) Using a thicker archwire with stoppers

An undersized archwire can shift within the bracket slots, sliding from left to right until it contacts one terminal bracket or tube, leaving an overhang on the opposite side. Placing an appropriately thicker wire that better fills the slot or adding stops (either soldered or crimpable) on the wire prevents this lateral drift. Class II elastics or removing bite blocks won't address the central issue of insufficient wire dimension. Changing bracket prescriptions is unnecessary if the bracket is intact. Thus, a properly sized wire, potentially with stoppers, directly resolves the side-to-side wire movement.

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174. (C) Microetch the restoration surface and apply a bonding agent

When brackets repeatedly fail on previously restored teeth, the culprit is often insufficient micromechanical retention on the smooth restoration. Microetching (sandblasting) the composite surfaces creates a roughened texture, enhancing bonding. Following microetching, an appropriate resin bonding agent helps ensure an optimal bond. Simply etching the composite longer may not achieve adequate retention if the surface is not properly roughened. Halogen or LED light curing time is important but not the main solution. Glass ionomer cement typically adheres to tooth structure differently and is less effective than resin-based adhesives on composite restorations.

175. (B) Sealing the band margin with a light-cured resin or removing and rebonding

Microleakage under an orthodontic band can allow plaque and cariogenic bacteria to infiltrate the tooth surface, contributing to demineralization and sensitivity near the gingival margin. To manage this, either the band is removed, the tooth surface cleaned and possibly remineralized, then the band is refitted, or the band margin is sealed with a resin if the fit is otherwise acceptable. Strengthening the archwire has no effect on microleakage. Systemic antibiotics are neither indicated nor standard for localized demineralization. While fluoride varnish can help remineralize the enamel, sealing or rebonding addresses the root cause—poor band adaptation.

176. (C) Temporary anchorage device (TAD)

A temporary anchorage device (TAD), also known as a mini-screw or micro-implant, is a small titanium or stainless-steel screw placed into the alveolar or palatal bone to serve as a stable anchor for orthodontic movements. Once the desired tooth movement is complete, the TAD is removed, leaving minimal or no permanent damage to the bone. A palatal implant typically integrates more permanently, while a zygomatic plate is a specialized fixture used for severe anchorage needs in orthognathic contexts. The transpalatal bar is a fixed appliance linking upper molars, not a bone-anchored device.

177. (B) Buccal alveolar bone between the second premolar and first molar

For en-masse retraction of anterior teeth, TADs are frequently inserted in the buccal alveolar bone between the maxillary second premolar and first molar. This location provides good cortical thickness, reasonable soft tissue access, and an optimal line of force to retract the anteriors. While palatal placements are possible for specific mechanics, the mid-palatal suture is more commonly used for expansion appliances or certain anchorage setups. Placing a TAD near the mental foramen pertains to the lower arch region, and direct palatal shelf anchorage is often reserved for intrusion or specialized movements.

178. (A) TADs rely solely on alveolar bone, minimizing reciprocal tooth movement

Conventional anchorage in orthodontics often depends on other teeth, meaning that as some teeth move, others can shift as well (reciprocal movement). Temporary anchorage devices circumvent this by fixing directly into alveolar bone, providing a near-stationary anchorage point that does not rely on adjacent teeth. They are not permanently integrated—TADs are designed for temporary use, removed after treatment. They are constructed of metal, not rubber, and although they have a high success rate, they can fail due to poor placement, infection, or excessive loading. Hence, minimal reciprocal movement is their primary advantage.

179. (C) Surgical correction of skeletal Class III

Temporary anchorage devices excel in providing anchorage for localized tooth movements, such as molar intrusion, distalizing posterior teeth, and retracting anterior segments en masse. However, surgical correction of a true skeletal Class III discrepancy typically involves orthognathic surgery (e.g., mandibular setback or maxillary advancement) rather than TAD placement alone. TADs can assist in certain presurgical or postsurgical movements but do not themselves correct significant skeletal discrepancies. Hence, while TADs are invaluable for complex tooth movements, they cannot replace surgical interventions for major skeletal corrections, making (C) the exception among these indications.

180. (A) Palatal implant is permanently integrated, TAD is removable

A palatal implant is a more invasive anchorage solution that osseointegrates with the palate, typically intended for longer-term usage in orthodontic or prosthetic procedures. Conversely, a TAD (mini-screw) is designed for temporary, readily reversible anchorage. TADs are placed and removed in a minor procedure, typically retaining stability without full osseointegration. They can be used in both adolescents and adults, provided sufficient alveolar bone is present. Palatal implants do not "always fail" in six months, and TADs do not need broad palatal coverage. Thus, the main distinction is the permanence versus temporary nature of integration.

181. (C) Inserting TADs in the buccal cortex near the molars

Molar intrusion requires a stable anchor capable of directing vertical forces without unwanted reciprocal movements. TADs placed near the first molars in the buccal cortex provide a stable, localized anchorage point for applying intrusive force on these teeth. Class III elastics anchored on the lower arch risk extruding lower molars or shifting lower incisors. Facebow headgear can help with distalization and limited intrusion, but compliance issues and potential side effects can undermine success, especially if 24-hour wear is required. Vigorous gum chewing doesn't selectively intrude molars. TAD-based intrusion is both efficient and predictable.

182. (A) Remove it and place a new TAD in an alternate location

If a TAD loosens prematurely, it generally loses anchorage reliability. Orthodontists typically remove it and either reposition a new TAD in a slightly different site with better bone density or switch to another anchorage solution. Forcing the screw deeper risks tissue damage or further failure. Converting a mini-screw to a palatal implant requires a wholly different insertion protocol. Continuing with a loose TAD is ineffective, as it no longer provides stable anchorage. Therefore, the best immediate course is to remove the failing TAD and reinsert a new one in a more suitable location.

183. (B) Enhanced oral hygiene and possible chlorhexidine rinses

Mild inflammation around a TAD often stems from plaque accumulation or improper brushing. Emphasizing meticulous oral hygiene, providing antimicrobial mouthwashes (e.g., chlorhexidine), and removing any local irritants can reverse early peri-implantitis or mucositis around the TAD. Immediate removal is not necessary unless mobility or significant infection is evident. Advancing the TAD deeper may aggravate tissue trauma. Dismissing the bleeding as normal adaptation invites worsening inflammation or potential TAD failure. Thus, improving hygiene and monitoring tissue response are the first steps, with reevaluation to determine whether further intervention is required.

184. (B) They create either separation or retraction forces, depending on design

Orthodontic coil springs can be "open" or "closed." Open-coil springs are used to push teeth apart (creating space or maintaining separation), while closed-coil springs generate pulling forces to retract teeth or close spaces. The coil's elasticity provides continuous force as it compresses or elongates. Minimizing friction at bracket interfaces is more about bracket design and archwire-ligation systems. Archwire rigidity is maintained by wire selection, not coil springs. Ligatures are secured by conventional ties or modules, not by coil springs. Thus, coil springs' fundamental role is to create or maintain specific interbracket forces.

185. (C) Overstretching the spring far beyond its working length

Closed-coil springs function best when stretched within a specified range, delivering steady, controlled forces. Overstretching the spring can cause excessive force levels, potential bracket damage, patient discomfort, or breakage of the coil. Proper protocol includes measuring bracket distance, selecting a spring length that delivers the intended force, and attaching it between the bracket or hook points. Regular monitoring ensures the spring maintains the correct tension as space closes. Thus, "overstretching" is an incorrect step, while the other options are valid procedures in the safe application of closed-coil springs.

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186. (B) Rotation wedge or couple with a steel ligature

Minor rotations often persist late in treatment, requiring delicate torque or rotation corrections without requiring major archwire changes. A rotation wedge (small wedge placed under a ligature) or a steel ligature couple can direct a specific force around the bracket, derotating the tooth incrementally. Elastomeric separators are used to create interproximal spaces prior to banding, headgear addresses anteroposterior anchorage or distalization, and a posterior bite block primarily helps open the bite or control vertical growth. Hence, a rotation wedge or ligature couple is most probable for minor rotational tweaking.

187. (C) Increased plaque retention and potential gingival inflammation

If ligatures remain in place for prolonged periods, they can accumulate plaque and debris around the bracket and gingival margin. Excessively tight ligatures also create hard-to-clean areas, exacerbating gingival irritation and potentially leading to localized inflammation or decalcification spots. They do not inherently expedite space closure, nor do they cause TAD migration. Posterior crossbite improvement typically requires expansion or cross-elastics rather than over-tight ligatures. Thus, the main adverse effect of improperly maintained or overly tight ligatures is poor oral hygiene conditions, resulting in gingival inflammation and possible enamel demineralization.

188. (B) Bacterial biofilm accumulation in bracket-periphery areas

White spot lesions (WSLs) often develop in orthodontic patients because the brackets and bands create niches where plaque can easily adhere, and brushing becomes more challenging. These sites accumulate bacteria, leading to localized acid production and demineralization of the enamel's outer layers. Orthodontic adhesives alone do not cause WSLs, and fluoride overexposure typically does not produce white spots but rather diffuse staining or fluorosis if it occurs systemically. High salivary flow normally aids remineralization, so it's not an erosion factor. Decreased carbohydrate intake would theoretically lower acid production, not increase it. Consequently, plaque buildup is the main culprit.

189. (C) Dehiscence-related recession

When a tooth is moved too far facially or lingually relative to its alveolar housing, the bony plate may thin or partially disappear. In such cases, a bony dehiscence forms—a vertical defect exposing the root surface. This can manifest clinically as gingival recession in the region. Fenestrations are isolated "windows" of bone loss but might not always cause gingival recession. Traumatic brushing can exacerbate or create recession, but in orthodontic context, dehiscence from excessive tooth movement is more likely. Chemical erosion from mouthwash is not typically associated with localized recession of this nature.

190. (C) Place bite turbos or build-ups to keep the wire out of occlusal contact

When occlusal forces consistently dislodge the archwire from posterior tubes, introducing bite turbos or buildups can raise the posterior occlusion slightly, preventing direct contact with the appliance. This measure reduces the chance of the patient biting onto the bracket or wire. Merely overbending the wire might not reliably solve the issue and could introduce unwanted tooth movements. Changing to a larger bracket slot dimension is more complex and not necessarily indicated just for wire displacement. Prescribing muscle relaxants isn't standard orthodontic practice for such mechanical challenges. Thus, bite turbos or occlusal build-ups often provide an immediate solution.

191. (B) Only after occlusion is stable and the final tooth positions are confirmed

Posterior elastics (Class II or III) are used to correct anteroposterior discrepancies and require consistent wear until the molar relationship and final occlusal settlement are firmly established. Discontinuing them prematurely can cause relapse if the dentition or jaw relationship has not stabilized. They are not discontinued right after initial success because new tooth movements or settling can occur. Retention devices, not elastics, maintain the result post-braces. Hence, the standard guideline is to wait until near the end of active treatment when final positions are confirmed, ensuring stability before stopping elastics.

192. (C) Frequent rotation of the TAD upon force application

If a temporary anchorage device starts rotating or moves significantly when force is applied, it suggests loss of stability—an indication that the TAD is no longer osseous- or mechanically anchored. Mild redness may simply reflect localized plaque irritation. Feeling slight soreness on brushing without mobility isn't necessarily failure. A TAD that continues providing stable anchorage with no mobility is functioning normally. Rotation or wobbling points to loosening, necessitating prompt removal or reinsertion at an alternative site to maintain reliable anchorage and prevent further tissue damage.

193. (C) Bracket hooks or sharp tie-wings

If lips or cheeks are snagging on braces, it often points to protruding or sharp areas on the bracket—specifically, the tie-wings or any integrated hook that may be left with rough edges. Low-profile bracket designs are specifically made to reduce bulk and smooth transitions, so they are less likely to cause soft-tissue catches. Overly polished tie-wings would not typically catch. Passive self-ligating clips offer streamlined edges. Thus, the culprit is frequently a protruding or unpolished bracket hook or tie-wing that irritates and hooks onto the lips during mouth movements.

194. (C) Assertion is true, Reason is false.

Self-ligating brackets incorporate a built-in clip or door mechanism, reducing or eliminating the need for elastomeric or wire ligatures. Hence, fewer ligature changes are necessary, supporting the assertion's truth. However, these brackets do not completely eradicate friction. While they can reduce friction compared to traditional systems, some friction remains from wire-slot contact and the bracket's mechanical design. Therefore, the reason is incorrect in claiming friction is entirely eliminated. Self-ligation lessens friction but doesn't eliminate it altogether, making the assertion valid while the reason is overly absolute and thus false.

195. (B) Attempt thorough cleaning with ultrasonic scaler or hand instrument

When calculus or debris accumulates around the clip mechanism of a self-ligating bracket, the first step is to clean the area. Using an ultrasonic scaler or a specialized hand instrument can dislodge hardened deposits, allowing the clip to move freely again. Switching to a conventional bracket may be an option if attempts at cleaning fail repeatedly, but it's not the immediate solution. Leaving the bracket jammed would hamper wire changes or adjustments. Bonding another bracket on top is illogical and might damage tooth enamel or hamper bracket function further.

196. (D) CBCT (Cone Beam Computed Tomography)

Cone Beam Computed Tomography (CBCT) yields three-dimensional images of teeth and surrounding structures, allowing precise visualization of any root resorption or irregularities that might be overlooked on 2D radiographs. Periapical and panoramic X-rays can provide useful clues, but their overlapping structures and limited angles can mask mild root changes. Cephalometric radiographs offer skeletal and profile assessments but aren't as detailed for assessing specific tooth roots. Thus, CBCT is the most definitive tool for a 3D assessment of root integrity when significant or suspected root resorption is in question.

197. (A) Faster tooth movement

Reducing friction between the bracket and archwire generally allows more efficient translation of force to the tooth, enabling potentially faster or more consistent tooth movement. High friction can dissipate much of the applied force, slowing down the rate of movement. While torque expression can be influenced by bracket design, friction reduction primarily enhances sliding mechanics rather than torque. Bracket breakage would more likely result from excessive forces or poor bonding, and root resorption risk is multifactorial, not solely dependent on friction levels. Thus, lower friction commonly correlates with faster or more effective movement.

198. (B) Beta-titanium (TMA) wire

Beta-titanium (TMA) wires contain no nickel and maintain moderate flexibility, making them suitable for initial alignment without risking an allergic reaction in patients with Ni sensitivity. Cobalt-chromium may still contain small amounts of nickel, and stainless-steel typically has nickel

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content. Gold-plated wires are rarely used, and plating may degrade over time, potentially exposing underlying metals. Consequently, TMA wires offer a balanced alternative for Ni-sensitive patients needing flexibility in early stages. They provide enough springiness for alignment, though not as superelastic as NiTi, while avoiding the allergenic potential of nickel.

199. (C) Use a specialized primer or conditioner for hypoplastic enamel

Hypoplastic or defective enamel can have reduced mineral content and an irregular surface, making routine phosphoric acid etching less reliable. Specialized bonding protocols often include applying conditioners or primers specifically formulated for compromised enamel. These primers might contain more acidic or resin infiltration components that enhance mechanical retention. Conventional etch-and-bond steps may fail on severely defective surfaces, and self-etch primers alone may not suffice. Abandoning fixed appliances entirely can deprive the patient of necessary orthodontic corrections. Thus, employing an enamel conditioner or a specialized primer can significantly improve bracket adhesion in hypoplastic enamel cases.

200. (B) Rebond canines with precise bracket positioning and use finishing wires

To finalize alignment, moving the brackets to an ideal position on the canines allows the finishing archwires to deliver the correct angulation, torque, and leveling. This is a common step toward the end of treatment when certain teeth have erupted late or brackets were initially placed sub-optimally. A removable aligner might not provide the precise control needed unless the rest of the arch is equally stable. Extracting healthy canines for speed is unnecessarily aggressive and could lead to occlusal compromise. Class II elastics alone cannot correct rotational or vertical issues in the canines. Repositioning brackets is thus the best solution.

END

CHAPTER 09

PROSTHODONTICS AND CROWN & BRIDGE

1. (C) To obtain an initial cast for custom tray fabrication

   A preliminary (or primary) impression is taken to produce a basic cast that guides the design of a custom tray. It is often made with irreversible hydrocolloid or other material that provides a broad overview of the patient's edentulous anatomy. While it is not used for definitive denture borders or intimate detail recording, it gives essential information to fabricate a custom tray that will be used in the secondary impression stage. Options (A), (B), and (D) do not align with the initial stage's key function of preparing a well-fitting, individualized tray.

2. (B) Alginate (Irreversible hydrocolloid)

   Alginate is typically chosen for preliminary impressions of edentulous ridges because it is relatively inexpensive, easy to handle, and provides adequate detail for the initial cast. It also offers a quick setting time and minimal patient discomfort compared to other materials. Polyvinyl siloxane (A) and polyether (D) are more accurate but are usually reserved for the final impression due to cost and technique sensitivity. Zinc oxide eugenol paste (C) is more commonly used for secondary or wash impressions and is less flexible for preliminary impressions.

3. (B) To capture functional tissue extent and seal

   Border molding shapes the peripheral areas of the custom tray in contact with the dynamic tissues of the mouth, ensuring the final impression accurately reflects the functional depth and width of the vestibules. This step provides a seal that helps stabilize the denture and prevents food or air from getting underneath it. It does not directly establish the vertical dimension (A) or record intermaxillary relationships (C). Facebow transfer (D) relates to orienting the maxillary cast to the hinge axis and is not performed during the impression's border-molding process.

4. (D) It automatically determines the occlusal vertical dimension

   A custom tray is designed to ensure a more accurate impression by enabling controlled border molding (A), minimizing material distortion through uniform thickness (C), and requiring less impression material (B). However, it does not set or "automatically determine" the occlusal vertical dimension (OVD). OVD is recorded later through jaw relation procedures and clinical assessment. The impression tray's role is only to accurately capture the edentulous ridges and surrounding tissues. Hence, (D) is the exception among the listed advantages of a custom tray in complete denture procedures.

5. (A) Reduces chairside adjustments but is more costly

   The two-step final impression technique often involves border molding and a wash impression, typically yielding a more accurate adaptation of the denture base. This can reduce post-insertion adjustments, but it may require more time and resources, making it costlier overall. Contrary to (B), border molding can still be necessary in two-step impressions. The two-step method is frequently associated with increased accuracy, not less (negating C). A custom tray is still recommended (negating D), as it is critical in controlling impression thickness and in capturing a well-defined vestibular border.

6. (B) Maintaining the functional border movements of soft tissues

   A functional impression aims to capture the tissues in a dynamic state, reflecting their positions and movements during functions like smiling, speaking, or chewing. By allowing the patient to perform slight movements, the impression records the true

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functional extension of the denture periphery. Stiff materials (A) may limit muscle displacement, while failing to include the vibrating line (C) will compromise the posterior seal. Excessive pressure on seating (D) can lead to over-extension and distortion of the soft tissues, reducing the final denture's retention and comfort.

7. (B) Using short, gentle muscle movements to shape borders

Border molding relies on capturing the functional depth and width of the vestibule by slightly manipulating and activating surrounding musculature—like the orbicularis oris and buccinator. Gentle, repeated movements (e.g., smiling, pursing lips, swallowing) guide the impression material to replicate the dynamic periphery accurately. Heavy, continuous pressure (A) can distort tissues, and multiple rapid placements (C) compromise the tray's reference. Restricting patient movement (D) defeats the purpose of border molding, which depends on functional movements to properly define the denture edges.

8. (B) Add impression material with a reline method around the underextended area

If an underextension is detected in a final impression, selectively adding impression material and repeating the border molding in the affected region is an efficient corrective technique. This approach refines the impression without discarding the entire process. Relying on the existing impression with underextensions (A) compromises retention and stability, and repeating the preliminary impression (C) restarts the entire sequence unnecessarily. Extending the base after processing (D) is far less accurate and can result in multiple adjustments. Thus, spot-correction is the best next step.

9. (A) Hamular notch

The hamular notch, located at the junction of the maxilla and the pterygoid process, is key for establishing the posterior border of the maxillary denture. Accurate identification of the hamular notch allows the dentist or technician to determine the vibrating line and place the post-dam area correctly. The canine eminence (B) and incisive papilla (D) are important anterior landmarks, but they do not define posterior extension. The midpalatine raphe (C) runs along the midline and assists in orientation but is not specifically used for post-dam placement.

10. (C) Trimming away all periphery to ensure no contact with tissues

The custom tray periphery should contact or closely approximate the tissue during border molding to capture accurate vestibular depth and shape. Trimming away all peripheral contact (C) defeats the objective of a well-adapted border, leading to an underextended or imprecise impression. Using tray adhesive (A) prevents material displacement, functional movements (B) refine the denture's border, and ensuring even spacer relief (D) helps achieve consistent material thickness. The incorrect step, therefore, is eliminating peripheral contact entirely.

11. (C) Tissue rebound and eventual ill-fitting dentures

When too much pressure is applied during the impression process, the underlying tissues become compressed. Although the impression may initially seem to record the ridges snugly, tissues later rebound after the denture is fabricated, resulting in a poor fit and diminished retention. Retention (A) is not enhanced by overcompression, and functional sulcus depths (B) are compromised by tissue distortion. Reduced processing time (D) does not logically follow from excessive impression pressure. Thus, excessive pressure leads to unpredictable tissue displacement and ill-fitting prostheses.

12. (B) Functional impression with a soft-liner material over several days

In cases of severely resorbed ridges, especially in the mandible, a functional impression technique can greatly enhance stability by letting the denture adapt to the patient's real-time tissue dynamics. A soft-liner or tissue-conditioning material, worn for a few days, captures the functional state of the tissues and personalizes the fit. A simple stock tray with alginate (A) won't address complex stability issues. Single-step zinc oxide eugenol (C) might miss dynamic adaptation. For a shallow vestibule and minimal ridge, no impression modification (D) would likely fail to improve denture retention.

13. (A) Fibrous (Flabby) ridge

A fibrous or "flabby" ridge is an edentulous region where the alveolar bone has resorbed significantly, leaving hypermobile tissue that can be displaced under load. This condition typically occurs in the anterior maxillary region and complicates impression accuracy. Torus palatinus (B) is a bony growth on the palate, while an enlarged incisive papilla (C) or prominent maxillary tuberosities (D) involve different anatomical changes. Special "window" or selective pressure impression techniques may be used to record flabby ridges to avoid tissue distortion.

14. (B) Open-window technique or controlled relief over the flabby area

In flabby ridge cases, the open-window or controlled relief technique helps to avoid distorting hypermobile tissue. A special tray with an anterior "window" allows a low-pressure approach to the flabby tissues, providing a more accurate representation of the ridge without compression. High-viscosity materials (A) risk excessive distortion, and pressing hard with alginate (C) exacerbates tissue displacement. Omitting the anterior region (D) leads to incomplete coverage and poor denture support. Thus, the selective or minimal-pressure strategy ensures proper adaptation over mobile mucosa.

15. (B) Approximately 1–2 mm relief over the entire ridge

Generally, a relief of 1–2 mm is recommended to accommodate the impression material thickness and ensure a more uniform adaptation. This guideline helps prevent overcompression while still capturing adequate detail. No relief (A) can lead to distortion, especially if the tray fits too tightly. Extended relief of 3–4 mm (C) or more would generally be excessive unless specific anatomical constraints demand it. Having 5–6 mm relief exclusively in the anterior region (D) would compromise tissue detail in other critical areas. Hence, 1–2 mm overall is the standard.

16. (B) Oral candidiasis or denture stomatitis

Persistent burning or pain under the denture, particularly in the anterior maxilla, can be a red flag for denture stomatitis or candidiasis. This condition presents with inflamed mucosa, often aggravated by poorly fitting dentures or inadequate oral hygiene. While alveolar ridge resorption (A) is common and can lead to denture looseness, it typically doesn't present as a burning red flag symptom. Choice (C) concerns impression techniques rather than mucosal pathology, and (D) usually causes irritation at the posterior region. Thus, infection must be ruled out before taking new impressions.

17. (C) Tissue blanching at the labial sulcus on insertion

When a denture border is overextended, seating the denture can compress mucosal tissues, leading to visible blanching (whitening) in the area of excessive pressure. Excessive salivation (A) is often related to new dentures but not specifically to overextension. A prominent midpalatal suture (B) is an anatomical variation rather than a sign of denture border issues. Fracture near the post-dam (D) may be due to other stresses. Tissue blanching, especially in the labial or buccal sulcus, is a direct indication that the flange is extending beyond the functional depth.

18. (D) A is false, but R is true

Pain in the posterior palatal seal area typically arises from overextension or excessive pressure, not underextension. Thus, the assertion is incorrect. The posterior palatal seal indeed helps compensate for processing changes like polymerization shrinkage and minor movements, making the reason statement true. Therefore, R is correct, but it does not validate an incorrect assertion. Consequently, "A is false, but R is true" is the proper relationship for these statements in the assertion-reason format.

19. (C) Incorporate a higher posterior palatal seal thickness

A high palatal vault can lead to compromised retention if the posterior palatal seal (PPS) is insufficient. Slightly increasing the PPS thickness helps create a better seal and compensates for the steep palatal curvature. Using a non-perforated stock tray (A) is not specifically required; custom trays are usually preferred. Extending the tray arbitrarily 10 mm beyond the vibrating line (B) risks overextension. Avoiding border molding (D) is detrimental to retention. Hence, customizing

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the PPS to accommodate a high vault is the most significant management step.

20. (B) Swallowing test to check seal retention

The swallowing test is an effective clinical method to confirm the presence of a functional posterior seal. When patients swallow, the movement of soft tissues helps confirm whether the denture remains stable or if air leaks in. The "S" sound test (A) primarily assesses occlusal vertical dimension and phonetics, while radiographs (C) do not offer direct functional insight into how the seal behaves with tissue movement. Although the Valsalva maneuver (D) can show soft palate function, it's less clinically relevant for evaluating the final posterior seal.

21. (B) Correct border extension and posterior seal

Poor retention often stems from underextended borders or an inadequate posterior palatal seal, which compromise suction. By accurately molding the periphery and creating a well-adapted post-dam, the denture can better resist displacement. Merely raising the occlusal vertical dimension (A) can cause discomfort and does not guarantee retention. Using stiffer base materials (C) or eliminating compensatory curves (D) focuses more on durability and occlusal harmony, respectively, not on the fundamental retention mechanism. Ensuring a complete functional seal is the key to better stability.

22. (C) Thorough border molding with functional movements

To address instability linked to short border extensions, border molding is vital in capturing the maximum functional vestibular depth. Functional movements—like slight cheek retraction, puckering, and smiling—aid in defining the correct extension. Harder denture teeth (A) or occlusal rest seats (B) target different issues, and plaster (D) isn't commonly used as a final impression material for complete dentures. By focusing on precise border molding, the retentive capacity of the denture improves significantly, preventing dislodgment during daily activities like speaking or smiling.

23. (B) Shorten the denture border near the retromolar pad

When sore spots are localized to an overextended flange, the immediate solution is to relieve that area to reduce tissue impingement. While occlusal adjustments (A) may also be needed, border overextension typically requires direct trimming or adjustment first. Telling the patient to adapt (C) would prolong discomfort. Fabricating a new denture base (D) is a last resort if the existing one is fundamentally flawed. By relieving the overextended border and checking the occlusion afterward, most localized tissue irritation can be resolved more efficiently.

24. (B) Mucostatic impression technique

After allowing tissue healing with a tissue-conditioning liner, a mucostatic impression technique places minimal pressure on the tissues, capturing them in a resting state. This approach is ideal for fragile or previously abused tissues, as it avoids further distortion or compression, ensuring a better-fitting final prosthesis. A high-pressure technique (A) risks exacerbating tissue trauma, while a simple hydrocolloid (C) may not provide sufficient accuracy or border detail. Plaster wash (D) is rarely used in routine complete denture impressions because it lacks elasticity and can be cumbersome.

25. (B) The mandible's position when the condyles are in the most unstrained, superior-anterior position in the glenoid fossa

Centric relation is the bone-to-bone relationship, independent of tooth contact, where the condyles articulate with the thinnest portion of their respective discs in the glenoid fossa. It's considered a repeatable, reference position for constructing complete dentures. Maximum intercuspation (A) depends on teeth contact and can vary with restorations or wear. A protrusive position (C) shifts the mandible forward, and patient-reported comfort (D) might not coincide with this stable, anatomically reproducible position. Thus, the recognized definition focuses on the most superior-anterior, unstrained condylar position.

26. (A) Gothic arch tracer

A Gothic arch tracer, also called an intraoral or extraoral tracing device, helps identify the centric relation by enabling the patient to move their mandible in various directions. The apex of the tracing indicates CR. A pantograph (B) is more often used in advanced gnathologic studies or complex prosthodontic rehabilitations. A facebow (C) transfers the spatial relationship of the maxilla to the condylar hinge axis but does not directly record CR. A pulp tester (D) is for endodontic diagnosis, unrelated to jaw relation records.

27. (C) It is a reproducible mandible-to-maxilla relationship

In complete denture fabrication, CR offers a stable, repeatable reference point for mounting the casts and setting the occlusion. Since no natural teeth remain, a consistent skeletal relationship is needed to achieve balanced occlusion and reduce post-insertion errors. CR does not dictate esthetics (A) or pupillary alignment (B); those are separate considerations. Additionally, CR is not necessarily the same as maximum intercuspation (D), which relies on tooth contacts that an edentulous patient no longer has. Hence, CR's reproducibility makes it central to denture fabrication.

28. (C) Using the patient's old dentures alone without clinical verification

Clinicians often use a combination of phonetic evaluations, facial measurements, and interocclusal rest space assessment to determine the correct VDO. Merely relying on an old set of dentures, especially without verifying their accuracy, is risky. Old dentures may have worn occlusal surfaces or an incorrect vertical dimension. Phonetics (A), facial measurements (B), and assessing the rest space (D) are standard, recognized clinical approaches. Therefore, discarding clinical verification and trusting only the old denture's vertical dimension is the exception that can lead to inaccurate results.

29. (C) They offer adjustable occlusal plane and vertical dimension

Wax rims allow the dentist to modify height and plane to suit the patient's esthetic and functional requirements. By altering the wax rim, the clinician refines the occlusal plane and vertical dimension. This is more flexible than relying on an existing denture, which might not reflect current anatomy or correct jaw relationships. Facebow transfer (A) is a separate process, and wax rims do not eliminate CR verification (B). They actually facilitate it. Finally, wax rims are integral to esthetic assessments, not obstacles (D).

30. (A) 61–63 mm

The occlusal vertical dimension (OVD) is typically derived by subtracting the interocclusal rest space (2–4 mm) from the rest vertical dimension (RVD). If the RVD is 65 mm, subtracting approximately 2–4 mm yields an OVD range of 61–63 mm. Maintaining an appropriate interocclusal rest space helps ensure comfort, proper phonetics, and minimal TMJ stress. Choosing 65 mm (B) suggests zero interocclusal rest space. Options in the 66–68 mm (C) range indicate a negative rest space, while 59–60 mm (D) might create an overly large rest space.

31. (C) "S" sound

The "S" sound (sibilant sound) is commonly used to assess freeway space and vertical dimension. When patients pronounce "S," the upper and lower teeth or wax rims should come close without touching, indicating a proper interocclusal distance. Although other phonetic checks like "M" (used to observe lip closure at rest) and "P" (used to watch lip function) can be informative, the "S" sound is the specific test for vertical dimension calibration in complete denture fabrication. "Ch" sound is less commonly used for VDO confirmation.

32. (B) Decrease the OVD slightly and reevaluate

If a patient reports strain, discomfort, or difficulty with speech at a newly established vertical dimension, it is often too high. The interocclusal space is insufficient, leading to muscular fatigue and phonetic issues. Decreasing the OVD and reassessing phonetics, comfort, and esthetics is the logical correction. Increasing the OVD further (A) exacerbates the problem, while rushing to process dentures (C) ignores patient feedback. An alveoloplasty (D) is a surgical procedure for bone contour and is unrelated to reducing OVD for improved comfort.

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33. (C) Facebow transfer

The facebow transfer precisely orients the maxillary cast in relation to the patient's hinge axis and reference plane, providing an accurate starting point for setting the occlusion in an articulator. The interocclusal centric record (A) relates mandible to maxilla at centric relation, while a protrusive record (B) and lateral excursive record (D) help set condylar guidance or check excursive movements. Only the facebow transfer specifically aligns the maxillary cast with the real-world axis-orbital plane, ensuring the proper arc of closure is replicated on the articulator.

34. (B) Recording the centric relation with the patient's jaws slightly parted

Recording centric relation requires the upper and lower rims to contact precisely at the predetermined vertical dimension. Having the jaws "slightly parted" is incorrect, as that does not capture a stable skeletal relationship. Adjusting wax rims for lip support (A), using the ala-tragus line to approximate the occlusal plane (C), and verifying freeway space with phonetic tests (D) are correct steps. Hence, the only incorrect step in this list is recording CR with the jaws not fully at the chosen occlusal vertical dimension.

35. (C) TMJ discomfort and muscular strain

Excessive OVD reduces the normal freeway space, forcing muscles into a near-constant state of contraction. This leads to fatigue, discomfort, and potential temporomandibular joint strain. Esthetics (A) may worsen, especially if the patient appears "open-jawed." An increased OVD decreases the freeway space, not increases it (B, D). Therefore, the major effect of an overly high vertical dimension is muscle pain and joint stress. Adjusting the OVD downward usually resolves these complaints by restoring a more natural resting posture for the mandible.

36. (A) Increase the freeway space by reducing wax rim height

When patients exhibit strain on lip closure and poor speech articulation at the trial stage, the occlusal rims are likely too high, causing inadequate freeway space. Increasing that space by trimming the rims helps relieve muscular tension and improves phonetic clarity. The facebow transfer (B) aligns the maxilla to the articulator, but it won't fix an incorrect vertical dimension. Proceeding with final mounting (C) or adding wax (D) worsens the problem of excessive OVD. Hence, lowering the rim height is the immediate and logical adjustment.

37. (B) The wax rim is undercontoured in the labial region

If the patient's upper lip appears sunken or lacks support, it often suggests inadequate labial fullness of the maxillary wax rim. By adding wax anteriorly, the lip can rest more naturally, enhancing facial esthetics. Excessively high vertical dimension (A) presents with difficulty closing the lips, not necessarily a sunken appearance. An occlusal plane set too high (C) might affect the plane orientation but doesn't directly cause lip support issues. Overextension of the mandibular rim (D) typically impacts tongue space or vestibular comfort, not lip support.

38. (B) Facebow transfer record

A facebow transfer record orients the maxillary cast in the articulator relative to the condylar axis, approximating how the maxilla is positioned in the skull. This is crucial for semi-adjustable articulators that mimic condylar guidance. A zinc oxide eugenol wash (A) is typically part of impression refinement rather than articulator mounting. "Balanced occlusion record" (C) is not a standard term—balanced occlusion is verified after tooth arrangement. An arbitrary protrusive record (D) might be collected to set condylar inclination, but the facebow is typically the essential addition.

39. (B) Use phonetics, especially sibilant sounds, and observe relaxation of lips

Guidelines emphasize a combination of phonetic tests and visual inspection of the lips to confirm adequate freeway space. Having the patient speak sibilant sounds ensures the rims don't contact prematurely, while relaxed lips indicate proper rest posture. Sole reliance on old dentures (A) may be inaccurate if they are worn or misaligned. Skipping patient verification (C) can lead to critical errors. Alveolar ridge augmentation (D) is a surgical procedure that may be considered in

severe resorption but is not the standard protocol for routine VDO checks.

40. (D) A is false, but R is true

While some clinicians might occasionally skip the facebow transfer, calling it merely "optional" is misleading—standard prosthodontic guidelines strongly recommend it for accurate orientation of the maxillary cast. The reason statement correctly describes the function of a facebow transfer: it replicates the spatial relationship of the maxillary arch to the hinge axis. Therefore, the assertion is false (facebow transfer is not just casually optional), and the reason is true. This discrepancy indicates that (D) is the correct response.

41. (A) Decreasing OVD slightly

Premature contact during sibilant sounds typically signals an excessive vertical dimension of occlusion, leaving insufficient space for the tongue and lips to articulate clearly. Reducing the OVD helps reestablish the appropriate interocclusal distance. Increasing OVD (B) would worsen phonetic problems. Adjusting the posterior palatal seal (C) mainly affects retention, not speech articulation. Altering centric relation (D) relates to anteroposterior or mediolateral jaw positioning, not the vertical dimension. Hence, trimming the wax rims to lower the OVD is the most direct solution.

42. (B) Remove wax from the lower rim

TMJ discomfort and clicking on closure are classic signs of excessive vertical dimension, indicating inadequate interocclusal rest space. The immediate and logical first step is to lower the OVD by removing wax from one or both rims—commonly from the lower for convenience. Adding wax (A) raises the OVD further, compounding the strain. Soft liners (C) may be helpful in final denture adaptation but do not solve a vertical dimension mismatch. Mounting and processing the dentures (D) before correcting the vertical dimension would lock in the error.

43. (B) Reduce wax in the labial flange region and lower the occlusal rims

An overly prominent labial contour and high vertical dimension can create a strained lip seal and fullness. Correcting the labial wax flange contour and reducing rim height helps restore a natural lip profile and comfortable closure. Increasing the OVD (A) worsens the problem, while alveoloplasty (C) is unnecessary unless there are severe bony undercuts or exostoses. Skipping adjustments and moving forward (D) fixes nothing and yields patient dissatisfaction. Thus, recontouring the labial flange and lowering the occlusal rim remains the most direct remedy.

44. (A) Increasing the OVD to restore a healthier rest space

In patients with advanced ridge resorption, wearing old, overclosed dentures often leads to TMJ strain and a collapsed lower facial height. If the new wax rim evaluation indicates residual underclosure (muffled phonetics and collapsed appearance), raising the occlusal vertical dimension helps reestablish a more balanced rest space for the muscles and TMJs. Accepting the current OVD (B) perpetuates underclosure, while further decreasing it (C) worsens the collapse. Modifying the posterior palatal seal (D) affects retention, not the vertical dimension or TMJ comfort.

45. (C) Overextension of the maxillary flanges

Ideal esthetics in complete dentures depends on balanced labial fullness (A), harmonious tooth shape and shade (B), and a correctly oriented occlusal plane (D). Overextended maxillary flanges (C) can distort facial appearance and cause discomfort, so this approach does not enhance esthetics. Instead, flanges should be extended just enough to maintain retention and support without impinging on tissues or creating excessive lip protrusion. Therefore, overextension is the exception, as it commonly leads to unesthetic bulging and possible tissue irritation.

46. (C) Matching tooth form to the patient's facial form and arch size

Aesthetically pleasing dentures integrate seamlessly with the patient's facial contours and arches. Selecting anterior teeth that complement the facial shape (e.g., square, tapering, or ovoid) and fit the arch dimensions provides a natural look. While patient preference (A) is essential, professional guidelines help refine the choice. Simply replicating old dentures (B) can perpetuate earlier inaccuracies or mismatches. A single universal shade (D) may

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look unnatural because slight color variations between different teeth can lend realism. Hence, customizing tooth form and size is crucial.

47. (C) Slight diastemas and correct inclination for a natural appearance

A more youthful smile often includes visible incisal edges and subtle spacing (diastemas), mimicking natural variation. Proper tooth inclination also helps produce a relaxed, realistic smile line. Simply placing teeth on the ridge (A) or tilting them lingually (D) might enhance function or stability, but may sacrifice esthetics. Reduced visibility of upper teeth (B) is typically associated with aging, not a youthful appearance. Therefore, slight diastemas and an appropriately labial inclination usually yield a more natural, age-appropriate esthetic outcome.

48. (C) Reset and re-align the anterior teeth midline in wax

An improperly aligned midline is a common esthetic complaint. Corrections should be made at the wax trial stage, not after final processing. Re-recording centric relation (B) might be necessary if the shift is due to a fundamental jaw relation error, but often it's simply an esthetic alignment issue. Telling the patient it's not noticeable (D) dismisses a valid concern, and waiting to fix it post-insertion (A) would require extensive lab work. Hence, adjusting the midline while the setup is still in wax is the most effective solution.

49. (C) Ignoring the patient's feedback on esthetics

Esthetic considerations are essential during the anterior try-in stage. Evaluating midline alignment (A), comparing the incisal plane to the patient's interpupillary line (B), and checking lip support (D) are standard steps. Patient input is also critical because dentures significantly affect facial appearance. Therefore, disregarding patient feedback (C) is incorrect practice. The collaborative approach ensures both functional and esthetic success, so ignoring the patient's preferences undermines the primary goal of a prosthesis that satisfies comfort, function, and appearance.

50. (D) A is false, but R is true

Esthetic outcomes for complete dentures extend far beyond occlusal balance, encompassing factors like tooth shape, positioning, color, and soft tissue support. Hence, stating that denture esthetics "relies solely on mechanical occlusal balance" (A) is incorrect. The reason (R) accurately enumerates multiple dimensions of esthetic denture design—lip support, midline alignment, tooth orientation, and more. Therefore, the assertion is false, and the reason is true, making option (D) the appropriate choice.

51. (A) Shorten the lingual flange

When the lingual flange impinges on soft tissues or conflicts with tongue movement, shortening that region usually alleviates discomfort and swallowing difficulties. Overlong flanges can cause functional problems by pushing against the floor of the mouth. Increasing the vertical dimension (B) addresses occlusal height, not flange contact. A tissue conditioner (C) helps if there is tissue irritation overall, but it does not resolve a mechanical overextension. Simply advising the patient to adapt (D) ignores the physical irritation caused by an overly extended flange.

52. (D) Immediately advising permanent relining of a brand-new denture

At insertion, dentists assess the denture for pressure areas, verify balanced occlusion in centric and eccentric contacts, and confirm that borders neither impinge on tissues nor hamper movement. A permanent reline immediately after delivery (D) is rarely indicated unless a major discrepancy is found. Minor modifications with adjustments or selective grinding typically suffice. Dentists usually allow a few weeks for the tissues and patient to adapt before considering any major reline. Therefore, demanding a permanent reline at insertion is contrary to standard practice.

53. (A) 24 hours, 1 week, and 1 month

Standard protocol for complete denture aftercare commonly involves a 24-hour check, where acute issues like sore spots or overextensions are addressed quickly, then a follow-up after approximately a week for further refinement. Another check often occurs at around one month to ensure adaptation and to handle any residual concerns. Though schedules can vary slightly among practitioners, this sequence (24 hours, 1 week, 1 month) is widely recognized.

The other options (B, C, D) do not align as closely with conventional guidelines for immediate to short-term follow-ups.

54. (B) Minimizes dislodgment during lateral and protrusive movements

Balanced occlusion arranges the artificial teeth so that bilateral, simultaneous contacts occur in centric and eccentric positions, which helps stabilize the denture against tipping forces. In contrast, monoplane occlusion uses flat occlusal planes with minimal cusp angles and typically requires less complex articulation. Balanced occlusion does not reduce the need for accurate centric relation (A); rather, it relies heavily on precise jaw relation. Monoplane occlusion (D) indeed may use no or minimal cusp angles, and balanced occlusion usually requires compensating curves, not eliminates them (C).

55. (B) Hanau's Quint components like compensating curve

Balanced occlusion relies on precise control of Hanau's Quint: condylar guidance, incisal guidance, cusp height, plane of occlusion, and compensating curve. By adding or adjusting compensating curves (Curve of Spee and Wilson), the dentist ensures simultaneous tooth contact during lateral and protrusive movements. Changes to vertical dimension (A) or midline orientation (D) primarily address esthetics and rest space. The interpupillary line (C) helps align the occlusal plane but does not manage eccentric tooth contact. The critical factor is refining cusp angles and curvature for balanced articulation.

56. (C) Increased dislodging forces during protrusion

Incisal guidance refers to the influence of the anterior teeth on mandibular movements. If it is too steep, the lower anterior teeth exert a significant vertical or horizontal force on the uppers during protrusive movements, tending to tip or unseat the dentures. This is because the posterior teeth may lose simultaneous contact, placing the emphasis on the anterior region. High incisal guidance does not enhance mastication comfort (A) or posterior stability (D), and it actually increases the need for compensating curves (opposite of B).

57. (B) Decrease incisal guidance and refine compensating curves

Overly steep incisal guidance forces excessive anterior contact during protrusive or incisal biting, often destabilizing the dentures. Reducing the incisal guidance angle distributes occlusal forces more evenly, which can be supplemented by refining compensating curves for balanced posterior contact. Increasing incisal guidance (A) exacerbates the problem, and eliminating centric relation (C) is neither possible nor appropriate. Adding vertical dimension (D) risks altering freeway space and does not directly reduce the dislodging forces associated with steep incisal guidance. Thus, rebalancing incisal guidance is key.

58. (B) Decreased muscle fatigue during mastication

Balanced occlusion ensures that both sides maintain stable contact during function, minimizing the lateral tipping forces on the dentures. This equilibrium can reduce muscle strain by allowing more efficient chewing. While balanced occlusion can be more complex (A), it is often not cheaper (C), and it does not guarantee an absolute absence of all occlusal discrepancies (D), as small variations can occur clinically. The principal advantage is that distributing occlusal forces bilaterally during function helps the patient chew more comfortably, diminishing overall muscular effort.

59. (A) Increasing the compensating curves

Adding or accentuating the compensating curves (Curve of Spee and Wilson) in the posterior occlusion helps maintain more simultaneous tooth contacts in eccentric movements, balancing the forces and stabilizing the dentures. Simply flattening the occlusal plane (B) may worsen tipping, while raising the incisal edges (C) increases anterior guidance, which can be destabilizing. Eliminating posterior contacts during lateral movements (D) shifts stress to fewer teeth, risking dislodgement. Hence, adjusting the compensating curves is a strategic approach to enhance balanced occlusion and denture retention.

60. (B) Enhanced denture stability via simultaneous contacts in excursions

Balanced articulation ensures contact of upper and lower teeth on both sides of the arch during lateral

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and protrusive movements. This simultaneous bilateral contact spreads occlusal forces more evenly, which can enhance stability, particularly in patients with significantly resorbed ridges. Monoplane setups often reduce lateral stability (A), as they can lack compensating curves. Balanced articulation typically increases complexity (C), potentially raising costs, not reducing them. Complete removal of anterior teeth from contact (D) is not recommended if seeking balanced occlusion. Thus, stable bilateral contact is the aim.

61. (C) A dental prosthesis replacing one or more teeth, easily removed by the patient

By definition, a removable partial denture is a prosthesis that replaces some missing teeth in an arch while the patient retains others, and it can be taken out and reinserted at will. This contrasts with fixed prostheses (B, D), which are not removable by the patient. Option (A) describes a bonded or adhesive fixed restoration, not a removable device. Hence, (C) accurately characterizes RPD as removable and designed to restore edentulous spaces while the rest of the natural dentition remains functional.

62. (B) Occlusal rest

An occlusal rest sits in a prepared rest seat on a tooth's occlusal surface, distributing occlusal forces down the long axis of the tooth, thus providing vertical support. The major connector (A) unites the RPD components across the arch, while the retentive clasp arm (C) prevents displacement of the RPD away from the tissues. The guide plate (D) assists in guiding placement and removal along a specific path of insertion. The occlusal rest is the principal feature for supporting the partial denture from sinking into the soft tissues.

63. (B) To provide a rigid link between the RPD components

The major connector's core purpose is to unite various RPD elements (rests, minor connectors, clasps) across the arch in a rigid framework, ensuring effective distribution of occlusal forces. The retentive clasp arms (A) engage undercuts, while occlusal rests (C) provide vertical support. Displacing gingival tissues (D) is never the goal; rather, partial dentures should be designed to respect soft tissue health. Consequently, the major connector acts like the backbone of the framework, distributing functional forces and maintaining structural integrity of the RPD.

64. (C) Lingual bar

A lingual bar is the primary choice for a mandibular major connector, positioned along the lingual aspect of the lower teeth and alveolar ridge. For maxillary RPDs, major connectors typically include palatal strap, palatal plate, horseshoe (U-shaped), or anterior-posterior palatal straps. Therefore, among the options given, the lingual bar is incorrect for maxillary arches. That design is found in mandibular RPDs. Palatal strap (A), palatal plate (B), and anterior-posterior palatal strap (D) are all valid maxillary major connector configurations for partial dentures.

65. (A) Provides better support in cases of torus palatinus

A U-shaped or horseshoe major connector is often used when a patient has a prominent torus palatinus, as it avoids impinging on that bony prominence by leaving it uncovered. However, it may be less rigid than a broad palatal strap because it covers less palatal area. Wide palatal straps typically provide more coverage (C) and greater rigidity (D). Horseshoe connectors often must be made thicker to compensate for reduced coverage (negating B). Hence, if a large torus palatinus exists, the horseshoe design is a suitable alternative.

66. (B) Placing a lingual bar at least 3–4 mm away from the gingival margin

For a mandibular RPD, the lingual bar major connector should be located sufficiently below the free gingival margin—often about 3–4 mm clearance—to avoid impinging on soft tissues. This design helps maintain gingival health by preventing irritation or compression. A wide lingual plate (A) can trap plaque and irritate tissues if it's too extensive. Rests should lie entirely on tooth structure (C) to avoid applying force to soft tissues. A flexible plastic connector (D) that contacts tissue can cause instability and tissue trauma over time.

67. (B) Placing all retentive clasps in the same undercut depth

Although clasps generally engage undercuts for retention, different abutment teeth can demand varying undercut depths based on their anatomy, the type of clasp, and the overall RPD design. Not all undercuts have the exact same depth. Surveying the cast (A), creating proper rest seats (C), and carefully planning a path of insertion (D) are correct design fundamentals. Dictating one universal undercut depth for all clasps overlooks individual tooth variation and mechanical needs, making option (B) the incorrect step in RPD design.

68. (C) 4 mm

A mandibular lingual bar typically requires at least 4 mm of vertical clearance from the free gingival margin to the floor of the mouth to avoid impinging on the soft tissue during normal tongue and muscle movements. A shallower distance may require an alternate design like a lingual plate. Two or three millimeters (A, B) may be insufficient to maintain gingival health and comfort. Seven millimeters (D) is more than adequate but unnecessary for standard guidelines. Therefore, 4 mm is conventionally cited as the minimum clearance.

69. (A) Sublingual bar

When the floor of the mouth is shallow, a standard lingual bar may not provide the required 4 mm clearance from the gingival margins. A sublingual bar is placed slightly deeper into the sublingual space, maintaining adequate tissue clearance while still providing rigidity. A horseshoe connector (B) pertains to a maxillary design, and broad palatal straps (C) are also maxillary. An incisal rest (D) is not a major connector. Hence, the sublingual bar addresses the problem of limited vertical space in a shallow mandibular arch.

70. (C) Lingual plate

With a high floor of the mouth and insufficient clearance for a standard lingual bar, a lingual plate is often recommended. It adapts along the lingual surfaces of teeth, extending to the cingulum areas, and is shaped to avoid tissue impingement. A cingulum bar (B) covers only the cingula and might not provide the rigidity needed. A labial bar (D) can be used if severe lingual tissue undercuts exist, but it is typically less esthetic and used only if lingual placement is truly unfeasible. The lingual plate thus balances support and comfort.

71. (A) A rest that prevents movement of the distal extension base away from the tissues

In distal extension RPDs, the indirect retainer is typically placed opposite the extension base, helping counteract the rotational movement that could lift the denture off the tissues. It is usually in the form of a rest on a tooth located anterior to the fulcrum line. Direct clasps (B) engage undercuts for direct retention. Minor connectors (C) connect components to the major connector, and a posterior palatal seal (D) is related to complete dentures, not partials. Thus, the indirect retainer works to stabilize a distal extension.

72. (C) Class III

Kennedy Class III describes an edentulous area that is bounded by remaining teeth anteriorly and posteriorly on one side of the arch. Class I indicates bilateral edentulous areas in the posterior segments, Class II indicates a unilateral edentulous area that extends posteriorly (i.e., it's not bounded distally), and Class IV indicates a single, anterior edentulous area that crosses the midline. Hence, a single, unilateral space fully surrounded by teeth is classically a Class III scenario.

73. (B) The distal extension lacks a tooth for vertical support at its far end

A distal extension RPD is open-ended, with the most posterior portion resting on edentulous tissue rather than being supported by an abutment tooth. Consequently, additional considerations—like properly designed rests, indirect retainers, and careful selection of the retentive elements—are needed to prevent the prosthesis from rotating or impinging on tissues. A palatal plate (A) is a maxillary concept, not universal. Distal extensions can be maxillary or mandibular (C). Bounded edentulous areas actually have more predictable support (D) since they're flanked by abutment teeth.

74. (D) Magnetic clasp

Standard retentive clasp designs include circumferential (Akers) clasps, bar (Roach) clasps, and variations such as reverse circlet, ring

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clasp, and half-and-half. A magnetic clasp is not a recognized conventional design in removable partial dentures. Magnets sometimes appear in specialized prosthetic solutions, but they are not typically described as "magnetic clasps." Thus, the first three are standard RPD clasp forms, while (D) is not typically employed in mainstream partial denture frameworks.

75. (B) Bar clasps engage undercuts from below the survey line, while circumferential clasps approach from above

Bar (Roach) clasps typically approach the tooth undercut from the gingival direction, crossing the soft tissues first and then engaging the undercut in the cervical third. Circumferential (Akers) clasps encircle the tooth, approaching the undercut from the occlusal aspect. They both serve retentive functions, but their approach direction and design differ. Statement (A) inverts their directional approaches. They can be fabricated in a variety of materials, not exclusively stainless steel or gold (D). So the key contrast is how they engage the tooth from below or above the survey line.

76. (B) Using flexible clasp arms that only engage mild undercuts

A flexible clasp arm can engage a conservative undercut, providing adequate retention without placing overly high stress on the abutment tooth during placement and removal. Using the largest possible undercut (A) can lead to excessive retentive forces that may damage the abutment. Placing rests on gingival tissue (C) is unacceptable because it fails to direct forces along the tooth's long axis and can injure soft tissues. Minor connectors (D) are essential for linking components. Thus, a flexible clasp in a mild undercut is the best strategy.

77. (C) Preparing guide planes on the proximal surfaces of the tilted teeth

When abutment teeth are tilted, well-prepared guide planes on the proximal surfaces help establish a common path of insertion, ensuring the framework seats correctly. A parallel-sided major connector (A) is not specifically the solution for tilted abutments, and the altered cast technique (B) is more about adapting the tissue-bearing area for distal extensions. Eliminating rests on tilted abutments (D) can compromise support, so the better approach is to create or modify guide planes that compensate for tilt, aligning the RPD path of placement effectively.

78. (D) Relying solely on the major connector for vertical tissue support

In bilateral free-end cases, the altered cast technique (A) ensures accurate adaptation of the denture base to the tissues, while indirect retainers (B) help control rotation around the fulcrum line. Infra-bulge clasps (C) can offer retentive advantages for certain undercuts. However, the major connector (D) is not the principal source of vertical support. True vertical support arises from rests on teeth and proper extension of the denture base. Thus, trusting the major connector alone for tissue support is incorrect in a distal extension RPD.

79. (A) One-third the buccolingual width of the tooth

An occlusal rest seat is typically prepared to be about one-third the buccolingual width of the tooth and at least 1.5 mm deep in the central fossa or marginal ridge area. This dimension ensures adequate thickness and strength of the rest, while leaving space for normal occlusal function. Occupying the entire occlusal table (B) is excessive. Less than 1 mm wide (C) is too narrow for reliable force distribution. Extending 3 mm over the marginal ridge (D) is unusually large; a typical rest seat crosses it just enough to ensure stability.

80. (B) Oral candidiasis or epulis fissuratum

Inflamed or hyperplastic tissue in the edentulous ridge can indicate pathological changes such as epulis fissuratum (related to ill-fitting dentures) or candidiasis. Both can cause persistent inflammation and hamper RPD success. The dentist should manage these conditions before final fabrication. Well-controlled diabetes (A) and stable abutment periodontium (C) do not directly produce hyperplastic lesions, though they can affect healing. Tori (D) are bony growths, not typically presenting as inflamed hyperplastic tissue. Hence, suspicious tissue changes should prompt investigation for epulis fissuratum or candidiasis.

81. (B) Blanching or ulceration of the vestibular mucosa upon insertion

Overextension in an RPD flange typically manifests as soft tissue blanching, tenderness, or eventual ulceration where the denture impinges on the vestibular mucosa. Mobility of anterior teeth (A) might be linked to periodontal issues, while rapid calculus formation (C) pertains to oral hygiene or saliva composition. Premature occlusal contact (D) can cause discomfort but is not specific to flange overextension. Thus, blanching or trauma in the vestibule is the key clinical indicator that the denture flange extends too far apically.

82. (A) Both A and R are true, and R is the correct explanation of A

An occlusal rest, precisely contoured in a prepared seat, channels masticatory forces along the tooth's axis instead of letting the denture sink into the mucosa. This support mechanism (A) spares the soft tissues from bearing excessive force, and the reason statement (R) aligns perfectly with that principle. Properly designed rests indeed optimize distribution, decreasing alveolar ridge stress and tissue compression. Consequently, both statements are true, and (R) provides the correct explanation for (A), fulfilling the requirements of an accurate Assertion-Reason pairing.

83. (B) Incorporating a metal reinforcement or thicker major connector

Persistent framework fractures often signify inadequate rigidity or insufficient metal thickness in high-stress areas. Strengthening the major connector or adding a metal reinforcing element can bolster fracture resistance. Thinning it (A) worsens structural integrity. Lingual rest seats (C) do not inherently improve overall connector strength. Indirect retainers (D) help control rotational movement, so removing them might increase stress on other components. Therefore, a sturdier design with adequate metal thickness in the major connector is key to preventing recurrent breakage.

84. (C) Dental surveyor

A dental surveyor is specifically used to analyze a cast for undercuts and to determine the most advantageous path of insertion for a removable partial denture. It identifies where clasp tips should engage the tooth, delineates guide planes, and helps define the framework design. Panoramic radiographs (A) evaluate the jaw structures but do not measure undercuts. A facebow transfer (B) relates the maxillary arch to the hinge axis for mounting, not for partial denture undercut analysis. An alginate impression (D) obtains a cast but does not provide undercut surveying.

85. (B) Relieving the overextended flange in the buccal vestibule

If the RPD's polished surface extends too far into the buccal vestibule, it can be displaced by muscle movements, causing frequent dislodgment. Trimming and reshaping the flange to accommodate functional movements is crucial. Shortening rests (A) does not address flange contact with tissues. Creating deeper undercuts (C) might jeopardize tooth integrity and can be invasive. Simply adding more teeth (D) or artificial units does not solve the mechanical issue of overextension. Correcting the buccal extension ensures the denture fits more passively and resists displacement.

86. (A) Moving the indirect retainer more anterior

In a Class II situation, an indirect retainer placed too close to the fulcrum line may be less effective in preventing distal extension lifting. By positioning the indirect retainer more anteriorly—on a canine or first premolar away from the fulcrum line—the rotational forces are better resisted, and the base stability increases. Thickening the lingual bar (B) or switching clasp types (C) does not directly address rotational lift. Removing the rest seat (D) would eliminate vertical support. Hence, moving the indirect retainer forward improves retention and stability.

87. (B) Adjust and relieve the impinging framework

When the framework causes localized soreness by pressing on soft tissues, the logical first step is to identify the area of impingement (often done with disclosing media) and selectively reduce or relieve the metal. A tissue conditioner (A) helps inflamed tissues heal but does not resolve the mechanical cause. Antibiotics (C) are unwarranted unless there is evidence of infection. Adding another occlusal rest (D) may redistribute forces but won't fix direct soft tissue impingement. Therefore, addressing

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the impinging framework is the immediate, most appropriate solution.

88. (A) Reduce the marginal ridge height

If a high marginal ridge blocks the retentive clasp from easily engaging its designated undercut, selective tooth modification can smooth the insertion path. Trimming a small amount of enamel to lower that ridge or re-contour the proximal area is often indicated. Switching to a labial bar (B) is a major design change, typically not necessary just because of a local contour issue. Increasing vertical dimension (C) is unrelated to clasp path. Removing the clasp (D) reduces retention. Carefully reducing the marginal ridge height best ensures smooth seating.

89. (A) A method to record alveolar ridge detail after the metal framework is tried in

The altered cast technique refines the fit of the distal extension base area by making a corrective impression while the RPD framework is seated in the mouth. This technique captures more accurate tissue detail under functional conditions. It differs from typical full denture reline (D) or immediate in-mouth framework fabrication (C). Additionally, it is not about ignoring facebow transfers (B). Therefore, the altered cast technique specifically references the procedure of adjusting and refining the cast with a second impression once the partial denture framework is trial-fitted.

90. (C) Polysulfide rubber base

Polysulfide (rubber base) impression material is frequently chosen for the altered cast technique because it offers good tear strength, adequate working time, and detailed capture of soft tissues under functional loading. Zinc oxide eugenol (A) can be used in some scenarios but is more rigid and less flexible for distal extensions. Plaster of Paris (B) lacks elasticity and is prone to fracture when removed from undercuts. Clear acrylic resin (D) isn't used as an impression material. Hence, polysulfide is a common choice.

91. (B) It ensures a more accurate adaptation of the prosthesis on compressible tissues

Distal extensions rest on soft tissues that vary in compressibility, so the altered cast technique refines the impression under realistic conditions with the framework in place, capturing how tissues deform under functional loads. This leads to improved fit and reduced tissue stress. It does not skip laboratory steps (A), nor does it remove the necessity for rests (C). It can actually extend treatment steps slightly (negating D), because a secondary impression is needed. Its primary advantage is better adaptation for tissue-supported segments of an RPD.

92. (C) Immediately adding artificial teeth and final polishing

A trial insertion of the metal framework is done to ensure it seats properly, confirm retention and stability, and identify any tight spots or binding areas that require adjustment. One does not proceed to add the artificial teeth and finalize polishing (C) immediately at this stage. Instead, the dentist must confirm a correct fit first. After making necessary adjustments, the framework can return to the lab for tooth arrangement. Therefore, the incorrect (or exception) step is to skip right to the tooth setup and polishing.

93. (C) Relies on support from both teeth and residual ridge tissues

Unlike complete dentures, which rely solely on edentulous ridges for support, RPDs gain support from abutment teeth (via rests) in addition to the soft tissues. Esthetic considerations (A) remain essential since partial dentures are often visible. Stress on the alveolar ridge (B) may be less if the RPD is tooth-supported, not necessarily more. Occlusal adjustments (D) can still be required to harmonize natural dentition with the prosthesis. Thus, the fundamental difference is that partial dentures leverage both tooth and tissue support for stability.

94. (B) Natural tooth contours and guide plane preparation

The RPD's insertion path depends on how the abutment teeth are shaped, including prepared guide planes on proximal surfaces and surveyed undercuts. These features guide the framework into position without interference. A lab technician's personal preference (A) is subordinate to clinical tooth anatomy. The major connector thickness (C) or acrylic color (D) has no direct influence on how

the denture navigates tooth contours. Hence, tooth contour and specifically created guide planes are crucial in defining a precise and repeatable path of insertion.

95. (C) Use a modified T-bar or reverse circlet clasp to engage the mesial undercut

Mesial undercuts can be advantageously engaged by specially designed clasps such as a reverse circlet or modified T-bar that approaches from the mesial direction. This leverages the existing undercut for retention. Grinding away valuable undercuts (B) wastes a natural retentive feature. A bar clasp from the mesial (A) is less conventional than T-bar or reverse circlet designs for mesial undercuts. Ignoring them (D) might reduce RPD retention. Therefore, employing a clasp that engages the mesial undercut is the correct approach.

96. (B) Adjust the abutment tooth intraorally using fine burs

If the framework binds lightly, the dentist typically makes minor intraoral modifications to the tooth and/or the metal. In cases where the metal is accurately cast, a slight adjustment on the tooth's proximal contour can achieve a passive fit. Finishing/polishing (A) before resolving the binding is premature. Forcing the framework (C) can harm both the restoration and tooth. Dismissing the patient (D) and trusting the lab cast ignores clinical discrepancies. Fine, controlled tooth adjustments ensure the partial denture seats comfortably without damaging the abutment.

97. (B) Indirect retainer placed anterior to the fulcrum line

In a Kennedy Class I or II design, the RPD can rotate about the distal-most abutments. An indirect retainer, often a rest on a canine or premolar, prevents the free-end saddle from lifting off the alveolar ridge during occlusal forces. A retentive clasp on the distal tooth (A) primarily anchors that tooth, while an additional major connector (D) isn't the usual approach to controlling rotation. Polishing (C) is for smoothness and comfort. Hence, an indirect retainer placed ahead of the fulcrum line is key to limiting rotation.

98. (D) Skipping patient input on esthetics if the design is clinically acceptable

At the final try-in, the dentist should check occlusion (A), confirm the framework-tissue relationship (B), and evaluate the trial arrangement of artificial teeth in wax (C). Crucially, patient feedback on esthetics is essential, ensuring the final prosthesis is both functionally and cosmetically acceptable. Neglecting patient input (D) is contrary to good practice. A partial denture significantly affects the patient's smile and comfort, so ignoring their perspective on appearance can lead to dissatisfaction. Thus, (D) is the incorrect or unacceptable step.

99. (B) Teeth adjacent to the edentulous area may experience damaging lateral forces

Bracing (stabilization) and reciprocation are essential to counteract retentive clasp forces. Without them, clasp activation can push the tooth laterally, possibly causing tooth mobility or damage over time. A properly designed RPD includes reciprocation to neutralize these forces. Passive seating (A) could be compromised if the partial shifts. Increased undercut utilization (C) isn't necessarily a direct result of lacking bracing. A partial lacking bracing typically needs more, not fewer, clasps (negating D). Hence, inadequate bracing leads to unopposed lateral forces on abutment teeth.

100. (A) Both A and R are true, and R is the correct explanation of A

An RPD design aims to distribute forces among multiple abutments and across the alveolar ridge, balancing mechanical load to enhance comfort and longevity. Properly contoured rests, rigid connectors, and correctly positioned clasps (R) prevent localized stress that can harm abutment teeth or tissues. Since distributing masticatory load (A) is a fundamental design objective, and the presence of well-engineered components (R) accomplishes that goal, both statements are true, and (R) logically explains (A). Thus, (A) is verified by (R).

101. (B) A cast metal or porcelain restoration permanently cemented to abutment teeth

An FPD is a tooth-borne prosthesis that replaces missing teeth. It is fabricated extraorally (in a dental laboratory) and then permanently cemented onto prepared abutment teeth or implant abutments.

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In contrast, removable partial dentures (A) are removed by patients at will. Direct restorations (C), like amalgam or composite fillings, do not require extensive laboratory fabrication or multiple abutments. Short-term diagnostic appliances (D) are not definitive restorations. The hallmark of an FPD is its fixed nature, typically involving crowns or retainers on supporting teeth.

102. (B) Retainer

A retainer is essentially the crown or extracoronal cast restoration that is cemented onto the prepared abutment tooth, securing the FPD in place. The pontic (A) is the artificial tooth replacing the missing space, while the connector (C) unites the retainer and pontic. Die spacer (D) is a thin layer used in the lab to ensure enough space for cement within a casting. Therefore, the retainer is the crucial attachment element that fixes the prosthesis to the natural tooth or implant abutment.

103. (B) It ensures adequate retention and resistance form for the final restoration

Proper tooth preparation—especially the angle of convergence (taper)—and sufficient axial reduction are necessary to ensure that the crown (retainer) fits accurately and resists dislodging forces. Excessive taper decreases retention, while insufficient reduction compromises the restoration's structural integrity. Uniform laboratory contours (A) are not the primary motive. Minimal clearance (C) may leave the restoration too thin or ill-fitted. Stress distribution (D) cannot be entirely prevented, but a proper design helps manage forces. Thus, well-designed preparation geometry secures the FPD under functional loads.

104. (D) Maximum retention with zero taper

Some degree of taper is mandatory for crown preparation to allow placement of the restoration. The generally accepted total occlusal convergence is around 6–10 degrees per axial wall, though many clinical situations may see slightly higher values. Absolute zero taper would make crown placement nearly impossible. Adequate occlusal clearance (A), a functional cusp bevel (B) for strength, and a suitable margin design (C) for periodontal health and fit are all essential. Thus, "zero taper" is the exception and not considered a practical or ideal principle.

105. (B) Similar occlusal clearance but more axial reduction for porcelain

A PFM restoration typically demands enough space for both metal substructure and porcelain veneer, necessitating greater axial reduction than a full metal crown. Occlusal clearance remains comparable, but the axial walls need extra thickness for proper esthetic layering. Shoulder or chamfer margins (C) can be used; many clinicians prefer a modified shoulder or deep chamfer for PFMs. Simply claiming there is no difference (D) is incorrect. Full metal crowns (A) generally require less overall reduction because they don't accommodate a porcelain layer.

106. (B) To ensure adequate thickness of the restorative material in heavy occlusal load areas

The functional cusp bevel provides extra clearance on the occluding cusp (buccal cusp of mandibular teeth or lingual cusp of maxillary teeth). This additional space accommodates sufficient thickness of restorative material (metal or porcelain) to withstand occlusal forces without fracturing. Although conservative preparation is important (A), the cusp bevel does remove more tooth structure in strategic locations to prevent restoration failure. Temporary crown removal (C) does not drive cusp bevel design, and shifting contact (D) is not the primary goal of the bevel.

107. (B) Increase buccal reduction to about 1.2 mm for porcelain

PFM crowns demand around 1.2–1.5 mm of labial (buccal) reduction to accommodate the metal substructure and a sufficient porcelain layer. Only 0.5 mm of space will likely result in a bulky or under-contoured restoration, inadequate esthetics, or compromised strength. While a full metal crown (C) or skipping porcelain (D) might handle minimal reduction, they alter the planned esthetic outcome. Proceeding with the suboptimal reduction (A) endangers functional and esthetic success. Therefore, further reducing the buccal surface to achieve enough thickness is the correct move.

108. (B) Place a core build-up with crown lengthening or orthodontic extrusion if needed

When caries extends below the gingiva, it compromises margin placement and the biologic width. A core build-up is typically placed after removing all caries, and if necessary, crown lengthening or orthodontic extrusion can expose sound tooth structure for a proper margin. Merely leaving subgingival margins (A, C) risks periodontal and restorative complications, while abandoning the tooth (D) may not be ideal if it's a key abutment and can be salvaged. Thus, properly restoring the tooth and ensuring adequate clinical crown length is the correct management.

109. (B) A distinct, continuous circumferential finish line with adequate thickness

FPD retainers rely on well-defined margins for accurate crown adaptation, a proper seal, and a smooth transition from tooth to restoration. A continuous, even finish line (e.g., a chamfer or shoulder) ensures the technician can fabricate a precise fit. Feather edge margins (A) can lead to insufficient material thickness, especially for porcelain. Placing margins arbitrarily 4 mm above the gingiva (C) is excessive and might compromise retention. Avoiding margins on proximal surfaces (D) is impossible for a circumferential crown. Hence, a well-defined, uniformly prepared finish line is pivotal.

110. (C) Leaving a rough, irregular finish line to enhance mechanical retention

Smooth and precise margins are crucial to ensure a well-fitting crown and to maintain periodontal health. Rough or irregular margins compromise the restoration seal, can accumulate plaque, and complicate laboratory fabrication. Depth cuts (A) help control occlusal clearance. Axial reduction (B) respecting the tooth's long axis enhances crown retention and resistance. A finish line placed at or slightly below the gingiva (D) may be appropriate when needed for caries removal or esthetics. A rough finish line for "mechanical retention" is therefore incorrect.

111. (A) Overcontoured final restoration

If there is not enough occlusal space, the technician must create the crown within a smaller vertical dimension or risk making the crown too thin and prone to fracture. Often, they compensate by bulking up material in other areas, leading to an overcontoured or bulky crown. This can adversely affect occlusion, aesthetics, and periodontal health. It does not improve esthetics (B) nor enhance crown strength (C). It typically causes more occlusal adjustment needs (contrary to D). Hence, the direct effect is an overcontoured or compromised restoration.

112. (C) Reducing the opposing tooth or considering enameloplasty

When insufficient occlusal space is available for an FPD, adjusting the opposing dentition can be a more conservative approach than over-reducing the abutment and risking pulp exposure. Minor enameloplasty or occlusal adjustment on the supraerupted opposing tooth can create the necessary clearance. A crown with minimal thickness (A) is prone to fracture or perforation. Elective endodontics (B) with post placement is not typically indicated unless the tooth is non-vital or heavily restored. Temporarily placing an onlay (D) does not directly solve the space deficiency for the FPD.

113. (B) Provide a full-coverage crown with a subgingival margin that encompasses the abrasion

Severe cervical abrasion can compromise retention and expose sensitive dentin. For an FPD abutment, a full-coverage crown that extends slightly subgingival can protect the damaged cervical area, control hypersensitivity, and provide adequate retention and resistance form. Omitting the abutment (A) may risk insufficient support for the prosthesis if that tooth is critical. A partial veneer (C) or inlay (D) may not fully address structural deficiencies or retention needs in an FPD scenario. Therefore, a complete crown that includes the abraded region is best.

114. (C) Crown lengthening surgery or orthodontic extrusion

When a tooth's clinical crown is too short to provide adequate retention and resistance, the dentist typically increases crown length. This can be achieved through surgical crown lengthening (recontouring alveolar bone and gingiva) or

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orthodontic extrusion (moving the tooth coronally). Merely performing gingivoplasty (A) adjusts soft tissue but does not address bone level. An incisal rest (B) is not a solution for a short clinical crown that requires a full-coverage retainer. Forgoing preparation (D) and partial coverage would compromise retentive form for an FPD abutment.

115. (B) 6–10 degrees per axial wall

Typical recommendations for crown preparation call for a total occlusal convergence (the combined taper of opposing axial walls) of around 6 to 10 degrees per wall. This helps ensure adequate retention while allowing the restoration to seat. Extremely low angles (A) can render the crown unseatable, and large angles (C or D) reduce retention significantly, leading to potential dislodgement. Therefore, the widely accepted guideline is in the moderate range of 6–10 degrees to balance practicality and retention.

116. (B) Pulpal necrosis or irreversible pulpitis

A large radiolucency close to the pulp suggests potential caries or pulp pathology. If the tooth is non-vital or close to necrosis, an endodontic evaluation is necessary before finalizing a full-coverage preparation. Gingival recession (A) is a soft tissue phenomenon, sinus perforation (C) typically concerns upper posterior teeth impacting the sinus floor, and an impacted supernumerary tooth (D) does not typically present as a radiolucency near the pulp. Ensuring pulpal health is crucial for a successful FPD abutment.

117. (B) Prolonged throbbing sensation persisting over 30 seconds

Long-lasting, intense sensitivity to cold often indicates deeper pulpal involvement, especially if the discomfort lingers well beyond stimulus removal. A short, sharp sensation (A) can be normal post-preparation sensitivity. Mild discomfort relieved by removing the temporary (C) suggests a high restoration or ill-fitting provisional. Sensitivity on biting (D) usually relates to occlusal trauma or a fracture. Hence, a prolonged throbbing response to cold points to possible pulpitis or pulp exposure, warranting a thorough endodontic evaluation if it does not resolve with standard protective measures.

118. (B) Both A and R are true, but R is not the correct explanation of A

Metal crowns often incorporate a slight bevel at the margin to improve adaptation and finish, particularly in areas like the chamfer. This can help reduce open margins or metal "ledges." For porcelain restorations, a different rationale applies: some designs may incorporate a slight bevel or modified shoulder to reduce chipping risk. However, the statement that "a beveled margin in a porcelain restoration reduces fracture risk" (R) does not fully explain why beveling helps metal adaptation (A). Therefore, both statements are true, but R does not clarify A.

119. (C) Perform crown lengthening or gingivectomy prior to the final impression

If a margin lies significantly below the gingiva, the biologic width might be compromised, risking chronic inflammation or attachment loss. Surgical crown lengthening or gingivectomy can expose more tooth structure, creating a more accessible margin for impression and final restoration. Simply proceeding (A) or skipping tissue retraction (B) can result in inaccurate margins. Placing the margin even deeper (D) worsens the issue. By recontouring soft tissue and/or bone first, the dentist ensures proper biologic width and a clean field for impression.

120. (C) Silicone putty "bite check" or clearance gauge

A clearance gauge or silicone putty index accurately measures the space between the prepared occlusal surface and the opposing dentition. This allows the dentist to confirm whether the reduction meets the required thickness for restorative materials. Relying solely on an explorer (A) or visual inspection (B) can be subjective and imprecise. Thermal pulp testing (D) is used to assess pulp vitality, not occlusal clearance. Therefore, putty-based or gauge-based measurement remains the most reliable method to ensure correct tooth reduction.

121. (B) Reduce buccal surface more to eliminate the undercut

If the prep has an undercut that prevents the crown from seating along the intended path, selectively reshaping that area is necessary. By reducing the buccal surface to remove the undercut, the final restoration can seat properly. Adding composite (A)

might correct small surface defects, but typically re-preparation is more predictable. A groove on the lingual surface (C) doesn't directly address the buccal undercut. Altering the path of insertion (D) is impractical if the rest of the prep design is established.

122. (C) Perform minor tooth preparation modifications to align both abutments

If the abutments have significantly different paths, the restoration won't seat properly. The dentist typically re-prepares one or both abutments slightly, creating a common path of insertion. Simply forcing the lab (A) leads to suboptimal internal fit or open margins. A partial coverage or onlay (B) might help if only minimal correction is needed, but it's still likely that some recontouring is required. Shortening the pontic (D) does nothing to address path divergence. Aligning abutment paths with controlled re-preparation is the most direct fix.

123. (A) Adequate interdental embrasure design

Proper embrasure space is critical for effective plaque removal and gingival health. If the proximal surfaces and margins are too tight, flossing becomes difficult or impossible, promoting plaque accumulation and inflammation. Eliminating the functional cusp bevel (B) or flattening the occlusal table (D) deals with occlusal aspects rather than interproximal clearance. While supra-gingival margins (C) can ease cleansing, they are not always feasible or necessarily addressing the embrasure space. Ensuring a well-contoured interproximal area with sufficient clearance for hygiene is key.

124. (A) Using a non-rigid connector near the middle of the span

Long-span bridges are at risk of flexing under load, which can transmit stress to abutments and the framework. Incorporating a non-rigid connector (like a stress breaker) toward the middle of the FPD allows slight independent movement of separate segments, reducing torque on abutments. Partial coverage rest seats (B) might not provide the necessary retention for a large span. Minimal clearance (C) can compromise porcelain thickness, leading to potential fracture. Purely adhesive resin bonding (D) is insufficient for large FPDs requiring rigid full coverage. Thus, a non-rigid connector is a recognized solution for lengthy spans.

125. (B) The portion of the FPD that unites the pontic with the retainer

In an FPD, the connector is the segment that bonds or fuses the retainer (crown) to the pontic (replaced tooth) or to another retainer. Connectors can be rigid (a solid metal or ceramic join) or non-rigid (precision attachments). The pontic itself (A) is the replacement tooth portion, and temporary devices (C) or rubber separators (D) are not FPD components. Therefore, a connector specifically refers to the link bridging the retainer and the pontic in the final prosthesis.

126. (B) Modified ridge lap pontic

The modified ridge lap pontic contacts the buccal aspect of the ridge for natural appearance while being contoured lingually to facilitate cleaning. A full ridge lap (A) contacts a large area of tissue, often trapping plaque. Conical (C) and sanitary/hygienic (D) pontics are more suitable for posterior areas with less concern for high-end esthetics and more emphasis on hygiene. Thus, a modified ridge lap pontic strikes a balance between pleasing appearance (mimicking tooth emergence) and maintainability in anterior FPDs.

127. (C) It forms a space between pontic and tissue for easy cleaning

A sanitary or hygienic pontic is designed so that it does not contact the edentulous ridge, leaving a gap for easy flossing and rinsing beneath it. This design is typically used in posterior segments where esthetic demands are lower, and hygiene takes precedence. It does not closely resemble natural emergence (A) or fully contact the ridge (B). It's not intended for maxillary anteriors (D), where aesthetics are critical. Therefore, the sanitary pontic's core purpose is to maintain good hygiene in less visible posterior regions.

128. (C) Saddle pontic

The "saddle pontic" (full ridge lap) completely overlaps the alveolar ridge, contacting it extensively and making cleansing difficult. Modern standards discourage its use due to increased risk of plaque accumulation and tissue irritation. Modified ridge

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lap (A), ovate (B), and conical (D) are commonly employed, each with specific indications—modified ridge lap and ovate emphasize esthetics, while conical is used in posterior areas with narrower ridges. Hence, the saddle pontic is the exception, as it is no longer recommended.

129. (B) Requires a socket-like depression in the alveolar ridge

Ovate pontics are highly esthetic because they emerge from a concavity or "socket" prepared in the ridge, creating the illusion of a natural tooth emerging from the tissue. A modified ridge lap (A) partially contacts the ridge and does not require a depression. Ovate pontics can be used in anterior or posterior regions (C), but are most favored in the esthetic zone. They typically provide excellent esthetics (D). Therefore, the defining feature is that ovate pontics necessitate a contoured ridge site for intimate tissue contact.

130. (D) Ovate pontic

The ovate pontic is considered the gold standard for esthetics in the anterior region due to its socket-like adaptation. It appears to emerge from the gingiva like a natural tooth. A hygienic pontic (A) has a space beneath, which is unaesthetic. Modified ridge lap (B) can be used for anterior replacements but is slightly less lifelike. Conical pontics (C) are usually reserved for narrow ridges and posterior areas. Thus, where the alveolar ridge is well-developed, an ovate pontic design confers the best esthetic outcome.

131. (B) Guided tissue regeneration to build up the ridge

In areas with deficient ridge contours, the dentist can augment the soft tissue or alveolar structure (e.g., with guided tissue regeneration, connective tissue grafts, or bone grafting) to develop a more rounded, "socket-like" shape. This procedure prepares the alveolar ridge for an ovate pontic that closely mimics natural emergence. If no surgical intervention (A) is done, the seat remains inadequate. Conical (C) or broad sanitary (D) pontics compromise esthetics, especially in anterior regions. Therefore, ridge augmentation is key to achieving an ideal ovate pontic site.

132. (B) Placing provisional restorations to maintain tooth position and occlusion

Provisional (temporary) crowns protect the prepared abutments from thermal sensitivity, caries, and drifting. They also preserve occlusion and gingival health. Exposing abutments (A) to the oral environment invites sensitivity and micro-movement. Permanently cementing the final crowns prematurely (C) does not allow lab finishing or trial adjustments. While fluoride varnish (D) can help reduce sensitivity, it is not an adequate protective measure alone. Thus, well-fitting provisional restorations are essential for patient comfort and abutment stability until the definitive FPD is ready.

133. (C) Protecting prepared teeth and maintaining aesthetics

Provisional (temporary) restorations shield the prepared abutments from thermal stimuli, contamination, and displacement; they also maintain normal tooth relationships and acceptable esthetics during fabrication of the definitive FPD. They do not finalize the permanent occlusion (A) but rather provide a transitional occlusal scheme. Plaque accumulation (B) is undesirable. Testing future implant sites (D) is unrelated; implants require separate evaluation. Hence, the key roles for provisionals include protecting dentin-pulp complex, preventing tooth movement, and offering short-term esthetics and function.

134. (C) Leaving open proximal contacts to prevent impingement on neighboring teeth

Provisional restorations should have proper proximal contacts to prevent drifting of adjacent teeth and to maintain the correct arch form. Intentionally leaving open contacts can lead to food impaction, tooth movement, and compromised final prosthesis fit. Using matrices or preformed forms (A) helps in fabrication, trimming margins carefully (B) ensures a good seal, and checking occlusion (D) prevents high spots and discomfort. Thus, (C) is the incorrect practice.

135. (C) Occlusal trauma and possible patient discomfort

A provisional restoration that is high in occlusion places excess forces on the abutments and can cause pain, mobility, or damage to the periodontal ligament. It does not improve final crown retention (A) or enhance gingival healing (B). Instead, it creates premature contact, leading to possible

trauma and discomfort. High occlusion does not provide beneficial relief (D); rather, it can be damaging. Hence, the direct effect of a supra-occlusal provisional is trauma to supporting tissues and patient complaints of tenderness or difficulty biting.

136. (C) Maintaining healthy soft tissues is essential for an accurate final impression

A well-contoured provisional that respects the gingival sulcus is crucial to preserve gingival health. Inflamed, overgrown tissue can distort the final impression, leading to an ill-fitting margin or compromised final restoration. Biologic width violation (A) must be avoided, not continued. Tolerating gingival inflammation (B) risks progression to more severe periodontal issues and inaccurate tissue form. Overextension (D) does not improve final retention but can hamper impression accuracy and cause discomfort. Hence, controlling gingival health is critical for an optimal final restoration outcome.

137. (A) The connector cross-section is too thin

A common reason for repeated fractures in multi-unit provisionals is an insufficient connector dimension. The connector area endures significant flexural stress, so if it's too narrow or thin, it's prone to break. Excessive occlusal clearance (B) typically doesn't cause fractures in provisionals—if anything, it might reduce contact stress. Material selection (C) is relevant, but both acrylic and composite can function if well-designed. Overcontoured embrasures (D) can cause gingival issues but not necessarily repeated connector fractures. Therefore, an inadequate connector thickness is the prime suspect.

138. (B) Incorporating a metal or fiber reinforcement in the provisional

Provisional restorations subjected to heavy occlusal loads are more prone to fracture. Reinforcing the interim prosthesis with a metal wire or fiber strip within the acrylic or composite can significantly enhance strength. A soft liner (A) is for tissue adaptation in dentures, not relevant here. Eliminating all occlusal contact (C) can lead to supra-eruption or occlusal changes. Switching to partial coverage (D) might reduce retention and is not necessarily stronger for bridging multiple missing teeth. Therefore, reinforcing the provisional is the most prudent decision.

139. (A) Heavy chamfer or rounded shoulder

All-ceramic crowns typically require either a heavy chamfer or a shoulder (often with a rounded internal angle) to provide sufficient porcelain thickness and reduce the risk of chipping. Feather edge (B) or knife-edge (D) margins provide inadequate thickness for ceramic, risking a weak margin. A metal collar margin (C) belongs to porcelain-fused-to-metal restorations, not all-ceramic. Hence, a well-defined heavy chamfer or a rounded shoulder is the recommended design to ensure structural integrity and good fit for all-ceramic FPD retainers.

140. (A) Both A and R are true, and R is the correct explanation of A

Die spacer is a thin coating placed on the die to create space for cement. If the internal fit is too tight, the crown may not seat fully once cement is introduced. The assertion (A) accurately states that die spacers are used, and the reason (R) clarifies that they help accommodate the luting agent. Hence, both statements are correct, and the reason directly explains the assertion.

141. (B) Polyether

Polyether provides excellent dimensional stability, fine detail capture, and good flow around gingival margins, making it a top choice for complex FPD cases. Irreversible hydrocolloid (A, C) is less accurate for final fixed prostheses. Zinc oxide eugenol paste (D) is often used in edentulous impressions but is not ideal for mobile gingival tissues in a multi-unit FPD scenario. Polyether's stable set and hydrophilic nature suit comprehensive crown-and-bridge impressions, including areas with recession and deep margins.

142. (D) Localized tissue retraction with an injectable retraction paste and cordless technique

When gingival bleeding and saliva are uncontrollable despite using cord, an injectable retraction paste can be a viable method. Some cordless systems combine astringent agents with a paste to push gingiva away gently while promoting hemostasis. This approach can reduce fluid contamination around the margin.

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A triple tray (A) is convenient but won't manage heavy fluid flow. Rubber dam isolation (B) on a crown prep is usually impractical unless margins are supra-gingival. Electrosurgery (C) might help remove hypertrophic tissue but is more invasive and not always indicated for mild bleeding.

143. (B) Re-impress with proper gingival retraction and air syringe control

Voids at the margins hinder accurate fabrication. The only reliable solution is to repeat the final impression under better isolation and technique, ensuring no air entrapment. Patching the voids (A) seldom yields a precise result. Changing the design to partial veneer (C) doesn't correct the margin inaccuracy. Fluoride mouthrinse (D) addresses sensitivity or caries prevention, not impression defects. Therefore, re-taking the impression with refined technique and proper tissue management is necessary for a successful final prosthesis fit.

144. (C) Using a two-cord technique and leaving the lower cord in place during the impression

In situations with subgingival margins and rapid tissue rebound, the two-cord technique is highly effective. The smaller first cord is placed to displace tissues laterally; the second cord provides additional displacement. Removing only the top cord just before injecting impression material preserves the gingival space. Repeated single-cord technique (A) might still allow tissue rebound. Splinting with a temporary (B) is less predictable for immediate impression needs. Switching to alginate (D) lacks the accuracy required for a multi-unit FPD. Therefore, the two-cord technique is optimal.

145. (B) A technique of mounting the working cast on an articulator with a removable segment that preserves the relationship

Split-cast mounting allows the operator to remove and replace the cast on the articulator accurately, often by means of indexing or keyways. This is helpful for verifying and adjusting occlusion or checking internal fit. Sawing out individual dies (C) is a separate process (die sectioning). Using different plasters (D) is not necessarily "split-cast mounting." The method described in (B) keeps the same orientation after the cast is detached and reattached, which is essential in complex crown and bridge workflows.

146. (C) Glass ionomer cement

Glass ionomer cement releases fluoride, which can help reduce secondary caries and maintain gingival health. It also provides moderate strength and good adhesion to tooth structure. Zinc phosphate (A) has high compressive strength but no fluoride release. Polycarboxylate (B) is less commonly used nowadays, with lower strength than glass ionomer. Resin-based cements (D) offer high bond strength but limited fluoride release. Hence, glass ionomer strikes a balance of fluoride release, decent strength, and biocompatibility suitable for many FPD cementations.

147. (C) It has improved early strength and lower solubility

Resin-modified glass ionomer cements combine the fluoride release and chemical adhesion of glass ionomer with the enhanced mechanical properties and reduced solubility offered by resin components. This results in faster setting, higher early strength, and better moisture tolerance compared to conventional glass ionomer. They do not eliminate the need for tooth preparation (A) nor do they lack fluoride (B). RMGICs, like conventional glass ionomers, can chemically bond to tooth structure (negating D). Thus, improved early strength and lower solubility make RMGICs advantageous.

148. (D) Excessively high humidity during cementation

Excess humidity can interfere with the setting reaction of certain cements, especially glass ionomer or resin-based cements, potentially weakening the bond and causing contamination. Ideally, abutments should be clean (A), marginal adaptation must be accurate (C), and proper film thickness (B) ensures seating and retention. High humidity (D) is detrimental rather than beneficial. Hence, dryness or controlled moisture is essential for a reliable cementation.

149. (B) Using a self-etch primer or total-etch protocol on the abutment surfaces

Resin-based cements achieve their highest bond potential when the tooth structure is properly etched or primed, enhancing micro-mechanical retention.

In a total-etch system, phosphoric acid is applied, followed by a bonding agent. Alternatively, a self-etch primer simplifies the step. Skipping surface conditioning (A) reduces bonding significantly. Saliva contamination (C) drastically weakens the bond. Inverting the retainer for lingual insertion (D) is not a standard practice. Thus, applying an appropriate etch/bond protocol on the prepared abutments is vital for optimal resin cement adhesion.

150. (C) A is true, but R is false

Final polishing and occlusal adjustments are indeed essential after cementation to eliminate high spots, refine margins, and ensure a harmonious bite. However, the reason statement incorrectly suggests that adjustments aim to remove the prosthesis from functional contact. In reality, the FPD must share occlusal load properly with natural teeth, not be completely out of occlusion. So while (A) is correct, (R) is an erroneous explanation. Therefore, the best match is that the assertion is true, but the reason is false.

151. (B) A non-biologic titanium or ceramic fixture placed in the jawbone to support prostheses

A dental implant is an alloplastic (non-biologic) fixture, typically titanium or sometimes zirconia, surgically placed in the alveolar or basal bone. Once integrated, it serves as an anchor for various prostheses, such as single crowns, bridges, or overdentures. Unlike removable partial dentures (A) that depend on clasps and tooth support, or resin-bonded bridges (D) that cement onto tooth enamel, implants function like artificial tooth roots. They provide retention, support, and stability for the overlying restoration. A telescopic framework (C) still depends on existing teeth and does not involve direct bone integration.

152. (B) Osteointegration

Osteointegration (commonly termed "osseointegration") is the direct structural and functional connection between living bone and the implant surface. Pioneered by Per-Ingvar Brånemark, this concept ensures that the implant fixture becomes a stable part of the jaw, bearing masticatory forces without a connective tissue interface. Fibrous encapsulation (A) is a failed integration scenario leading to a mobile implant. Epithelium-to-implant adhesion (C) occurs at the gingival collar, not within the bone. Collagen bridging (D) refers to connective tissue healing in other contexts, but not the stable bone-to-implant interface needed for load-bearing implants.

153. (C) It is biocompatible and promotes osseointegration

Titanium has unique biocompatible properties, meaning the body typically recognizes it as non-foreign, thus minimizing adverse reactions. Its surface chemistry encourages bone cells (osteoblasts) to attach and form a stable interface—a process essential for successful osseointegration. While it doesn't precisely match bone's modulus of elasticity (B), it's sufficiently compatible for load-bearing in the jaw. Titanium doesn't dissolve in the body (A). Though it is quite resistant, it can still be scratched under extreme conditions (D). Its primary advantage is its excellent biologic and mechanical compatibility in implant applications.

154. (D) Managing large cystic lesions in the jaw

Dental implants are routinely used to replace single or multiple missing teeth (A, C) and to retain overdentures (B), improving retention and stability. They are not indicated for "managing large cystic lesions" (D). In fact, active pathology or significant jaw defects must be addressed surgically or medically before implant placement. Implants rely on healthy bone volume and an absence of active disease for predictable osseointegration. Treating large cysts requires surgical removal or other interventions, not simply placing an implant, making that option the exception among typical implant indications.

155. (C) Often places a healing abutment or provisional crown at the initial surgery

In a one-stage (immediate) implant procedure, the implant fixture is placed, and instead of burying it beneath the gingiva for a second surgery, a healing abutment or immediate provisional is connected right away. This approach can reduce treatment time but requires specific conditions (adequate primary stability and favorable occlusion). It does not skip implant placement (A) and does not inherently guarantee superior osseointegration (B). In fact, it can be used in anterior regions, especially when

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immediate temporization is desired for esthetics (contrary to D).

156. (B) Adequate initial implant stability (high torque)

Immediate implant placement and immediate provisionalization require that the implant achieve sufficient primary stability—usually measured by insertion torque or resonance frequency analysis. If the implant is not well-anchored, micromovements could disrupt osseointegration, leading to failure. Minimal bone density (A) and large ridge defects (C) make immediate loading riskier, and an active infection (D) is a contraindication because it can impede healing. Therefore, stable fixation in healthy bone with a suitable insertion torque is crucial for a successful immediate implant protocol, especially in a highly visible anterior location.

157. (B) Measuring a safety distance of at least 2 mm from the canal

When placing implants near the inferior alveolar canal, maintaining a safe margin—commonly at least 2 mm below the canal floor—is crucial to avoid damaging neurovascular structures. Implants that impinge on or violate the canal can cause numbness, paresthesia, or severe complications. Merely selecting the widest implant (A) can be dangerous if the canal is too close. Placing the implant flush with the canal (C) risks nerve injury. Avoiding a surgical guide (D) is imprudent when precision is required. Hence, preserving a 2 mm safety zone is a standard guideline for posterior mandibular implants.

158. (C) Change the angulation or shorten the osteotomy to maintain a safe distance

Intraoperative nerve proximity demands immediate caution. If the osteotomy is dangerously close to the inferior alveolar nerve, the surgeon should modify the procedure—altering the angulation or decreasing implant length to preserve at least 2 mm of bone above the nerve canal. Proceeding with the full depth (A) risks nerve injury. Completely removing the implant and abandoning the site (B) may be unnecessary if a slight modification can achieve safe placement. Placing two narrow implants (D) may not solve the nerve proximity issue and could complicate the procedure further. Hence, repositioning or shortening is the proper response.

159. (C) Achieved primary stability in the bone

Primary stability, the mechanical anchorage of the implant immediately after placement, is the single most crucial factor in deciding whether an implant can be loaded early or immediately. High insertion torque and minimal micromotion are essential to protect the developing bone-implant interface from disruption. Neither the implant brand (A) nor the patient's subjective pain tolerance (B) directly determines loading protocols. The abutment color (D) is an esthetic or material consideration, not a functional criterion. Thus, robust primary stability paves the way for successful early loading strategies.

160. (C) Placing a healing abutment immediately for final soft tissue contour

A classic two-stage approach involves first placing the implant fixture into the prepared osteotomy (A), often subcrestal or at crest level (B) for proper bone coverage. Then, a cover screw is attached, and the soft tissue is sutured over the implant (D). This allows undisturbed healing and osseointegration. A healing abutment is typically added in the second stage—after the healing period—exposing the implant to the oral cavity and shaping the gingiva. Placing a healing abutment immediately (C) is more characteristic of a one-stage protocol. Therefore, for a true two-stage procedure, (C) is incorrect.

161. (B) Fibrous tissue encapsulation and potential implant failure

Stability of the implant during initial bone healing is paramount. If the implant repeatedly moves—often caused by insufficient primary stability or premature loading—the developing bone-implant interface becomes disrupted. Fibrous tissue, rather than bone, may fill the gap, leading to a loose implant that fails to osseointegrate. This phenomenon is characterized by a connective tissue interface (encapsulation) instead of direct bone contact. Enhanced osseointegration (A) or faster bone remodeling (C) are unlikely with persistent micromotion, which fosters microfractures. Overgrowth of gingiva (D) is unrelated and doesn't compensate for a compromised bone interface.

162. (B) Delay loading, allowing a standard healing period of 3–4 months

When primary stability is borderline, immediate loading elevates the risk of excessive micromotion and compromised integration. In softer maxillary bone, a prudent approach is to follow a conventional or slightly extended healing schedule to allow sufficient bone remodeling. Immediate placement of the final prosthesis (A) can lead to failure if the implant is stressed prematurely. Switching to a removable partial denture (C) might not be necessary if the implant is still viable. Forcing deeper placement (D) can damage vital structures or overheat bone, further jeopardizing integration. Hence, waiting 3–4 months is the safest balance.

163. (B) Peri-implantitis

Peri-implantitis involves inflammation around an implant with progressive bone loss and clinical signs like mobility, bleeding, suppuration, or pain. The radiograph typically reveals a vertical or crater-like defect around the fixture. Peri-implant mucositis (A) is a milder inflammation limited to soft tissue without bone loss. Cement excess (C) can contribute to peri-implantitis but is not the direct name of the condition; also, any foreign body can lead to inflammation, yet the presence of a distinct bony defect suggests advanced disease. Sinusitis (D) in the maxilla can occur, but it wouldn't typically cause localized bone loss and mobility.

164. (B) Non-surgical debridement plus local antimicrobial measures

When peri-implantitis is identified, especially at an earlier stage with moderate bone loss (around 3 mm), thorough debridement of the implant surface and surrounding tissues is critical. Adjunctive local antimicrobials or antibiotics can help control bacterial colonization. Explanting the implant (A) is typically a last resort if conservative treatments fail or severe bone destruction has occurred. Placing a larger implant around the existing fixture (C) is not a standard approach. Waiting until bone loss is more extensive (D) can worsen the prognosis. Hence, prompt decontamination and inflammation control are the best immediate strategies.

165. (B) 3 mm

Maintaining approximately 3 mm of space between adjacent implants helps preserve the inter-implant papilla and reduces crestal bone loss. This distance prevents merging of the biologic zones that form around each implant, supporting stable soft-tissue contours and blood supply. A 1 mm or 0.5 mm gap (A, D) is usually insufficient and may cause papillary deficiency or compromise alveolar bone. Six millimeters (C) is an overestimation, potentially wasting alveolar space if more implants are needed. Thus, a 3 mm inter-implant distance is a widely accepted guideline to foster healthy peri-implant soft and hard tissues.

166. (C) Poor osseointegration or early failure

Pain and mobility soon after placement suggest a failure of initial integration, possibly due to excessive micromotion, infection, or compromised surgical technique. Overextended margins (A) relate to prosthesis design, but there is no prosthesis yet at 2 weeks. Incisal wear on adjacent teeth (B) is unrelated to implant mobility. Mucosal thickening in the sinus (D) could occur with maxillary implants but doesn't typically cause implant movement and dull pain unless there's acute sinus involvement. Hence, suspect early failure (poor initial osseointegration) as the critical red flag, prompting immediate investigation.

167. (C) Firm stability with no mobility

In a two-stage implant protocol, uncovering occurs after the osseointegration period. A stable, non-mobile fixture that does not rotate under gentle torque typically indicates successful bone-to-implant contact. Any rotation (A) or discharge (B) suggests potential complications like infection or incomplete integration. Bleeding from the apex (D) is abnormal and indicates a possible breach or acute inflammation. The key sign of healthy integration is the implant's firm anchorage in the bone, often verified by manual testing or insertion torque for subsequent abutment attachment without signs of looseness.

168. (C) A is true, but R is false

A healing abutment, attached to the implant after uncovering, guides soft tissue healing and contours the gingival margin in preparation for the final

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restoration, making the assertion (A) correct. However, it does not preserve the occlusal vertical dimension (R). Vertical dimension pertains to jaw relationships, not the shape of peri-implant tissue. The final prosthetic abutment and crown help reestablish occlusal relationships, but the healing abutment merely protrudes through the gingiva. Therefore, R is false. Thus, the correct pairing is that the assertion is true, but the stated reason is false.

169. (B) Light contact in centric with slightly reduced contacts in excursions

In implant prosthodontics, it is commonly recommended to maintain a slight or even contact in centric occlusion to ensure the implant shares load. However, the implant lacks the periodontal ligament's shock-absorbing capacity, so we aim to minimize excessive lateral forces. Reducing excursive contacts helps protect the implant from stress that can lead to bone resorption or mechanical failure. Having no contact (A) can lead to supra-eruption in natural teeth or prosthetic issues. Heavy centric loads (C) or matching the intensity of natural teeth (D) can overload the rigid implant. A carefully balanced "light contact" approach is best.

170. (B) Resonance frequency analysis (RFA)

Resonance frequency analysis is used to measure the implant's stability by sending vibrational waves and measuring the response, expressed as an Implant Stability Quotient (ISQ). This non-invasive test can track changes over time. Pulp vitality tests (A) are irrelevant in edentulous areas. While CBCT (D) is excellent for evaluating bone volume pre-surgically or diagnosing pathologies, it doesn't quantify the mechanical stability at the implant interface. A facebow transfer (C) is used in occlusal orientation, not implant stability. Hence, RFA is the designated tool for assessing osseointegration progress clinically.

171. (D) Connective tissue graft around the implant

When an implant crown seems elongated due to tissue recession or inadequate keratinized tissue, a connective tissue graft can rebuild and contour the peri-implant soft tissues. This improves the esthetic "emergence profile," making the restoration appear more natural at the gingival margin. While gingivoplasty (A) only reshapes existing tissue, it does not add volume. Using a shorter abutment (B) won't fundamentally alter the tissue height. Pink porcelain (C) can help camouflage a gingival defect, but it doesn't address the soft tissue deficiency. Hence, a connective tissue graft is the most direct way to restore a harmonious gingival contour.

172. (B) Use a zirconia abutment

When metal shows through thin peri-implant tissue, swapping the metal abutment for a zirconia alternative can significantly improve gingival esthetics. Zirconia's light color reduces the shadow effect, blending more seamlessly with the surrounding tissues. A polished healing collar (A) wouldn't alter the final abutment coloration that causes the grayish tone. Increasing occlusal contact (C) addresses functional load, not gingival color. Trimming more tissue (D) would risk recession or further exposure of the abutment. Hence, employing a tooth-colored zirconia abutment is the best solution to diminish the grayish appearance at the margin and enhance the anterior esthetics.

173. (A) Locator attachments

For a severely resorbed mandible, locator attachments are a popular choice because they are low-profile, providing retention in limited vertical space. They also allow for slight divergence between implants and have easily replaceable inserts for adjusting retention over time. Magnets (B) are even lower in profile but typically provide weaker retention. Telescopic copings (C) require more vertical space and advanced techniques. Ball/O-ring attachments (D) can be effective but are taller than locators and might not be ideal in extremely resorbed ridges. Hence, locators balance retention, simplicity, and minimal vertical requirements.

174. (B) Replace the worn O-ring inserts and perform thorough cleaning

Ball/O-ring attachments rely on elastomeric inserts to grip the spherical abutment, creating retention. Over time, these O-rings wear, lose elasticity, and accumulate plaque or debris, leading to decreased retention. Simply re-torquing the abutment screws (A) won't fix the worn O-rings. Adding more implants (C) is a significant step and is typically reserved for cases of extreme instability or bone

issues. Advising denture adhesive (D) defies the point of an implant-retained overdenture. Therefore, replacing the worn inserts and thoroughly cleaning the components is the most direct and effective strategy to restore retention and comfort.

175. (B) Placing a smaller diameter abutment on a wider implant platform

Platform switching is a strategy where the abutment diameter is narrower than the implant's outer platform, creating a horizontal step. This design aims to position the implant-abutment interface more medially, away from the bone crest. Research suggests that platform switching helps preserve crestal bone and may improve soft tissue stability by reducing micro-gap effects and bacterial infiltration at the implant's outer edge. It does not refer to simply using matching diameters (A), nor does it solely mean switching materials (C) or altering implant designs mid-surgery (D). Thus, the correct definition involves a smaller abutment on a larger implant platform.

176. (B) Internal hex or conical connection

Contemporary implant systems frequently use an internal connection, often in a hexagonal or conical (Morse taper) form. These internal connections provide improved mechanical stability, help reduce micro-movements, and may better protect crestal bone levels. External hex implants (A) were historically popular but have largely been superseded by internal designs. Blade vent implants (C) are an older style rarely used now, and transosteal staples (D) refer to a mandibular staple implant technique, also seldom employed. Therefore, internal hex or conical connections dominate the market for two-piece endosseous implant systems.

177. (B) It helps create a bacterial seal and distribute forces effectively

Morse taper or conical connections produce a tight mechanical fit between the implant and abutment. This taper design reduces micro-gaps where bacteria could infiltrate, improving the seal and preserving peri-implant tissues. Additionally, the conical interface distributes occlusal loads more evenly along the implant, minimizing stress at the abutment screw. Contrary to (A), the frictional lock of the Morse taper can make abutment removal challenging if the fit is very tight. It does not negate the need for occlusal clearance (C), nor involve silicone interfaces (D). Thus, sealed force distribution is the primary benefit.

178. (C) Implants placed with platform switching

Abutment screw loosening can result from improper tightening (A), which fails to achieve the recommended preload, or from excessive lateral/occlusal forces (B) that exceed the screw's ability to maintain tension. A poorly fitting prosthesis (D) can introduce micro-movement or stress, leading to screw loosening. However, platform switching (C) generally aims to preserve bone and soft tissue by offsetting the abutment-implant junction. It does not inherently cause screw loosening; in fact, some evidence suggests it may reduce marginal bone stress. Thus, platform switching is the exception among factors typically contributing to abutment screw loosening.

179. (B) Screw-retained crowns often allow simpler retrieval and maintenance

Screw-retained implant restorations have an access channel for the retaining screw, making them easier to remove if repairs, adjustments, or maintenance are needed. Cement-retained restorations, on the other hand, may require crown destruction or invasive techniques to retrieve. Excess cement (C) is a known complication with cement-retained prostheses, potentially leading to peri-implantitis if not carefully removed. Screw access in the anterior zone can sometimes challenge esthetics (D), as the screw hole may need to be disguised with composite. Hence, the advantage for screw-retention (B) is its easier retrievability and maintenance, while cement-retention often offers better esthetics.

180. (A) Angled screw channel technology

Modern angled screw channel systems allow the screw access to emerge in a more palatal or lingual position, even when the implant is placed with a less-than-ideal orientation. This technology helps preserve the facial aesthetics by hiding the screw opening away from the visible smile zone. Simply placing the access hole on the facial surface (B) undermines esthetics. Using dark composite (C) is also suboptimal aesthetically. Overtightening the screw (D) risks screw fracture or other

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mechanical issues. Hence, an angled screw channel is the recommended solution for improved anterior esthetics.

181. (B) Return it to the lab for revision or remake

A precise fit is critical for long-term implant success. Marginal discrepancies can lead to cement washout, microleakage, or tissue irritation. Saliva or flowable composite (A, C) cannot reliably address structural inaccuracies, and these are improper methods for final restorations. Modifying the abutment significantly in the mouth (D) may compromise the intended design and fit, risking occlusal or structural issues. Hence, the appropriate step is to return the crown for correction, ensuring a proper seating and marginal adaptation to maintain peri-implant health and prevent complications.

182. (D) Using conventional polyether material to finalize the digital file

Digital impressions rely on intraoral scanning, not conventional impression materials. A scan body (A) is placed to accurately capture implant position, and the occlusal relationship (B) is scanned for bite registration. The data is compiled to produce a virtual model (C). Employing polyether (D) is a traditional approach if taking a physical impression, which would then be digitized externally. In a fully digital workflow, the final design file is generated via scanning software, eliminating the need for analog impression materials. Therefore, step (D) is incorrect in a strictly digital process.

183. (B) Peri-implant inflammation, possibly leading to peri-implantitis

Consistent plaque accumulation fosters bacterial colonization at the implant sulcus, precipitating inflammation of the peri-implant mucosa. Over time, this can progress to peri-implantitis with bone loss and possible implant failure. Plaque does not stimulate beneficial remodeling (A) nor does it spontaneously disappear (D). The soft tissue seal (C) is compromised by bacterial infiltration, not improved. Hence, inadequate oral hygiene around implants commonly triggers peri-implant mucositis first, and, if untreated, it can evolve into peri-implantitis, potentially threatening the implant's stability and longevity.

184. (B) It is peri-implant mucositis; emphasize improved hygiene and non-surgical debridement

Peri-implant mucositis features signs of inflammation (bleeding, redness, mild pocketing) limited to soft tissue, with no evident bone loss on radiographs. This scenario fits the definition precisely: pockets of around 4 mm, bleeding, but stable bone levels. Non-surgical therapy (scaling, localized antimicrobial application) plus improved home care can reverse mucositis. Peri-implantitis (A) involves progressive bone loss, which is not indicated here. Declaring implant failure (C) is premature if bone is intact. Replacing the existing prosthesis (D) without first addressing the soft tissue inflammation is unnecessary. Therefore, reinforcing hygiene and non-surgical debridement is the correct next step.

185. (B) A vertical or "saucer-shaped" defect around the implant

Peri-implantitis typically presents with a characteristic vertical or "saucer-like" bone loss pattern that follows the implant threads. This crater-like defect can appear circumferential or localized around certain aspects of the fixture. Uniform horizontal bone resorption (A) is more typical of periodontal disease in natural teeth. Mixed radiopaque-lucent lines (C) or dense lamina dura (D) near the collar are not indicative of peri-implantitis. Hence, the hallmark radiographic appearance for progressive peri-implant bone loss is usually a vertical pattern reflecting the destructive process around the implant threads.

186. (B) Surgical approach, including flap debridement and possible regenerative procedures

Moderate to advanced peri-implantitis with significant bone loss often warrants a surgical intervention. Flap debridement allows direct access to thoroughly clean the implant surface and remove granulation tissue. Regenerative techniques (e.g., bone grafts, membranes) may help restore lost alveolar bone if conditions are favorable. Merely prescribing better brushing (A) is insufficient for 4–5 mm bone defects. Extraction (C) might be considered if the damage is severe or the implant is mobile, but it is not the first option. Fluoride varnish (D) is irrelevant for implant surface healing. Surgical management is the recommended approach.

187. (A) Regular prophylaxis and assessment of peri-implant tissues

Continuous monitoring and maintenance are critical to preserve implant health. Routine hygiene appointments allow for professional debridement, early detection of inflammation, and reinforcement of home care. Not removing the prosthesis (B) can obscure hidden plaque or calculus. A 5-year interval (C) is too long for detecting early issues like mucositis or minor screw loosening. Antibiotic mouthwash (D) alone is insufficient and might lead to resistance if used indiscriminately. Hence, consistent professional scaling, patient education, and thorough inspection at regular intervals remain the cornerstone of implant maintenance protocols.

188. (C) Blocking out undercuts so the bar can friction-lock the prosthesis forcibly

An implant bar overdenture typically features a bar with attachments (clips) that lock onto it for retention. Passive fit (A) is crucial to avoid unwanted stress. Checking vertical space (B) ensures adequate thickness for teeth and acrylic. Proper seating of the attachments (D) assures stable retention. However, forcibly friction-locking the prosthesis by blocking out undercuts (C) can generate excessive stress or make insertion/removal difficult. Undercuts around the bar are usually relieved or adapted so the overdenture seats passively onto the clips, relying on the designed attachment mechanism rather than forced friction.

189. (B) Insufficient thickness or poor support of the porcelain veneer

Porcelain fractures often result from inadequate material thickness or suboptimal framework design beneath the ceramic. If the veneering porcelain lacks support, occlusal forces can create cracks. Light contact (A) usually reduces stress and is less likely to cause repeated fracture. Adequate cusp reduction on the abutment (C) ensures room for materials. An under-torqued abutment screw (D) could cause restoration mobility, but the typical manifestation would be screw loosening or abutment issues rather than repeated porcelain chipping. Poor porcelain support or minimal thickness remains the prime culprit behind frequent veneer fractures.

190. (B) Around 2 mm or more

A band of keratinized gingiva around an implant helps maintain soft tissue health, ease plaque control, and reduce mucosal discomfort. While some implants function well with less keratinized tissue, 2 mm or more is often cited as beneficial for optimal stability and hygiene. Eight to ten millimeters (C) is more than typically required. Zero keratinized tissue (A) might predispose to recession or inflammation. Pocket depth alone (D) does not address the role of keratinized gingiva in resisting mechanical irritation and fostering healthy peri-implant tissues.

191. (A) Both A and R are true, and R is the correct explanation of A

A diagnostic wax-up helps visualize the final prosthetic outcome, verifying tooth position, occlusion, and esthetics. From this, a surgical guide is fabricated to translate the planned implant position into the patient's mouth during surgery. Thus, the guide ensures precise angulation and location of the osteotomy, correlating with the intended restoration. This synergy between prosthetic planning and surgical execution prevents implants from ending up in awkward or suboptimal positions. Therefore, both the assertion and the reason are true, and R directly explains the purpose for employing a wax-up and guide before surgery.

192. (B) Custom angulated abutment

When an implant is placed at an angle that complicates the path of insertion or compromises esthetics, using an angulated or custom abutment can reorient the restorative platform. By adjusting the abutment's geometry, the final crown emerges more in line with neighboring teeth. A standard (stock) abutment (A) may not compensate for significant angulation. A ball attachment (C) is typically used for overdentures, not single crowns. A one-piece implant (D) lacks a separate abutment, so the angulation is fixed, offering no correction. Hence, a custom angulated abutment is the correct choice to rectify the path of insertion.

193. (B) Internal sinus lift (osteotome technique)

When vertical bone is insufficient in the posterior maxilla due to sinus pneumatization, a sinus lift is commonly performed. The internal (osteotome)

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sinus lift can be employed if the needed lift is moderate—usually up to around 3–4 mm. It involves creating an osteotomy near the sinus floor, gently elevating the membrane, and placing graft material below it. A ridge split (A) addresses horizontal deficiency, not vertical. An onlay graft via guided bone regeneration (C) might help alveolar ridge thickness/height externally but less effectively addresses sinus space. A connective tissue graft (D) only augments soft tissue, not bone.

194. (C) With stable glycemic control, success rates approach those of non-diabetics

Well-controlled diabetic patients can generally undergo implant therapy successfully, provided their glycemic levels (often indicated by HbA1c < 7% or as recommended by guidelines) remain stable. Studies show that when diabetes is managed, implant success rates are comparable to healthy individuals. Absolute contraindication (A) or certain failure (B) is incorrect if the disease is controlled. Antibiotics (D) may be prescribed depending on infection risk and surgical complexity; they are not categorically excluded. Thus, implants can succeed in diabetics whose blood glucose levels are well-monitored and stable, paralleling the outcomes in non-diabetic patients.

195. (C) The prosthetic material used for the final crown

Implant stability is influenced by local bone density (A) because denser bone provides better initial anchorage. Implant design and surface modifications (B) can enhance osseointegration. Surgical technique (D)—including drilling speed, irrigation, and torque—affects the heat generated and bone preservation, both critical to stability. The material chosen for the final crown (C)—be it zirconia, porcelain-fused-to-metal, or other—doesn't fundamentally alter initial implant stability. While occlusal forces on that crown can influence long-term load distribution, the crown's specific material does not determine the mechanical anchorage or integration of the implant.

196. (C) Anchored in the zygoma to rehabilitate severely resorbed maxillas

Zygomatic implants are extra-long fixtures that anchor in the body of the zygoma, providing support for prostheses in patients with extreme maxillary atrophy or large pneumatized sinuses. This procedure bypasses conventional alveolar bone (A) in the maxilla, which may be insufficient. Zygomatic implants can measure 30–52.5 mm or more, thus they are not shorter (B). They are specifically indicated for the upper jaw (maxilla), not the mandible (D). Consequently, zygomatic implants permit stable prosthetic rehabilitation when standard endosseous implants cannot be placed due to severely deficient maxillary alveolar bone.

197. (A) Smoking cessation or reduction prior to and after surgery

Heavy smoking is associated with poorer wound healing and a higher incidence of implant complications. Encouraging the patient to quit or significantly reduce smoking can improve the vascular supply and enhance osseointegration. Total abstinence even a few weeks before and after implant placement is recommended by many clinicians. Overdentures (B) do not necessarily circumvent the effects of smoking on bone healing. Mini-implants (C) are not specifically indicated to mitigate smoking-related risks; they have unique uses but are also susceptible to healing challenges. Delaying for five years (D) is arbitrary and may not solve the issue.

198. (B) Two vertical anterior implants and two tilted posterior implants

The "All-on-4" protocol typically involves placing two implants straight in the anterior region and two tilted implants in the posterior to avoid anatomical structures such as the sinus in the maxilla or the mandibular nerve in the mandible. Tilting permits a longer implant length and improved anterior-posterior spread without additional bone grafts. It does not mandate all implants be upright (A) or strictly short (C). The restoration (often a hybrid prosthesis) is usually screw-retained. Thus, the hallmark of "All-on-4" is four total implants, with posterior fixtures angled to optimize bone anchorage and prosthetic support.

199. (B) Rigid splinting of the implants via the prosthesis

Immediate loading in an "All-on-4" scenario demands that the newly placed implants are splinted together through a stable, rigid provisional

restoration. This unity minimizes individual implant micromotion by distributing occlusal forces among all implants. Heavy contacts in excursive movements (A) would increase micromotion. Zero contact in centric occlusion (C) would compromise function and risk undesired opposing dentition shift. Metal clasps (D) are typical for removable prostheses, not full-arch implant fixed restorations. Thus, bridging the implants with a stiff, well-fitting temporary significantly enhances primary stability and fosters successful early integration under immediate loading conditions.

200. (A) Both A and R are true, and R is the correct explanation of A

Routine check-ups allow hygienists and dentists to clean around implants, measure probing depths, and detect early signs of inflammation or changes in bone levels—even if the patient has no complaints. This early intervention can halt or reverse peri-implant mucositis before it escalates to peri-implantitis, which is harder to manage. Thus, both statements are correct: maintenance visits (A) are critical, and the reason (R) clarifies that identifying plaque or tissue issues early helps prevent advanced peri-implant disease. The reason directly supports the assertion's premise.

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CHAPTER 10

ORAL MEDICINE

1. (C) It is concerned with the diagnosis and medical management of complex orofacial disorders

   Oral Medicine involves the integration of medical knowledge with dental expertise to address conditions affecting the oral and maxillofacial regions. These conditions can be localized to the oral cavity or reflect systemic illnesses with oral manifestations. Through rigorous patient evaluation, careful history-taking, and use of diagnostic tools, Oral Medicine specialists identify the etiology of diseases and formulate personalized medical management plans. Unlike other branches focused on restorative or surgical aspects alone, Oral Medicine encompasses a broader domain of diagnosing orofacial diseases, emphasizing a holistic approach toward comprehensive patient care.

2. (C) Dr. Lester Burket

   Dr. Lester Burket is credited with laying the foundation for Oral Medicine as a distinct specialty, primarily through his influential textbook and academic leadership. He emphasized the relationship between systemic health and oral conditions, highlighting the importance of multi-disciplinary collaboration. His work inspired innovative research protocols and clinical guidelines, thereby shaping the trajectory of Oral Medicine programs worldwide. While other dentists have made substantial contributions to dentistry, Dr. Burket's approach focusing on comprehensive diagnosis, patient-centered therapy, and the intersection of medicine and dentistry remains a cornerstone in Oral Medicine education.

3. (C) Frequent association between oral findings and systemic disorders

   Oral Medicine recognizes that many oral pathologies are not isolated events but often indicative of systemic conditions such as autoimmune disorders, hematologic diseases, and endocrine imbalances. Early identification of oral changes can lead to timely diagnosis of underlying systemic issues. Collaboration with medical specialists, including internal medicine, rheumatology, and endocrinology, ensures a comprehensive treatment approach. This multi-disciplinary model optimizes patient outcomes by addressing both the local lesion and its broader medical context. Exclusively aesthetic or purely dental perspectives neglect potentially significant systemic correlations, highlighting the necessity of shared clinical expertise.

4. (C) Conducting major reconstructive surgeries of the jaw

   Oral Medicine specialists primarily focus on diagnosing and medically managing orofacial diseases, rather than performing extensive surgical procedures. They utilize detailed examinations, laboratory testing, and prescription-based regimens to treat a range of mucosal and salivary gland disorders. Another critical role is coordinating interprofessional care for patients with systemic conditions that present oral complications. Major reconstructive surgeries of the jaw typically fall under the domain of Oral and Maxillofacial Surgeons, who possess specialized surgical training. Therefore, while Oral Medicine professionals may advise on some surgical decisions, they do not routinely perform major surgeries.

5. (B) Oral Medicine places greater emphasis on systemic evaluation, whereas surgical fields highlight procedural interventions

   Oral Medicine prioritizes understanding systemic influences and their manifestations in the oral cavity. While a surgical field focuses on operative treatment of local pathologies, Oral Medicine specialists investigate comprehensive medical histories, laboratory results, and interdisciplinary assessments to pinpoint underlying systemic causes. This dual perspective recognizes that many oral lesions emerge from systemic conditions like immunologic disorders, endocrine imbalances, or hematological

abnormalities. Through an integrative approach, Oral Medicine identifies nonsurgical interventions and coordinates with other healthcare providers. In contrast, purely surgical fields are centered on operative procedures to address localized dental or maxillofacial pathologies.

6. (C) Integration of medical history and laboratory investigations

Oral Medicine practitioners acknowledge that complex oral lesions can be influenced by or reflective of systemic conditions such as diabetes, autoimmune dysfunction, or nutritional deficiencies. Hence, they examine detailed medical histories, family backgrounds, and laboratory data before arriving at a diagnosis. By analyzing blood work, imaging, and biopsy results, these specialists ensure a more accurate classification of the disorder. This approach helps pinpoint etiologies that may not be purely local. Dental extractions or cosmetic modifications alone are insufficient without establishing the root cause, making integrative analysis fundamental to patient-centric management.

7. (C) Obtain a thorough medical history, perform a biopsy, and consider systemic factors

In Oral Medicine, persistent mucosal lesions that do not appear to be fungal or inflammatory demand a comprehensive diagnostic workup. Non-scrapable white patches can signify conditions like lichen planus, leukoplakia, or even dysplasia. By assessing the patient's systemic medical background, clinicians can identify contributing factors, including autoimmune disorders or medication side effects. A biopsy is essential to rule out malignant transformation and establish a definitive diagnosis. Empirical treatments or conservative measures alone may delay definitive care and worsen patient outcomes, underlining the importance of a systematic diagnostic pathway.

8. (B) Initiate topical or systemic corticosteroids and consult with a physician for systemic evaluation

Mucous membrane pemphigoid is an autoimmune blistering disorder that can affect mucosal surfaces. Prompt management often involves anti-inflammatory or immunosuppressive therapies, typically with corticosteroids. However, systemic evaluation remains crucial because this condition may also impact ocular and nasopharyngeal tissues. An interdisciplinary approach with a patient's physician or rheumatologist ensures potential comorbidities are identified and addressed. Antibiotics alone will not resolve an autoimmune condition, and surgical interventions are generally reserved for complications like severe scarring. Early medical management significantly improves patient outcomes and reduces disease progression in mucous membrane pemphigoid.

9. (C) Thoroughly evaluating the patient's medical history, medications, and systemic status

The cornerstone of Oral Medicine lies in correlating systemic conditions with oral findings. Gathering a comprehensive medical history, including current medications and known disorders, helps anticipate drug interactions, immunological factors, and comorbidities that may influence oral health. This process enables tailored treatment strategies, whether medical or supportive in nature. Overlooking systemic contributors can lead to incomplete care, delayed diagnoses, or inappropriate interventions. Collaboration with physicians and other specialists further enriches case management, ensuring the entire clinical picture is considered before implementing any therapeutic measures. Such a thorough approach underpins best practices in Oral Medicine.

10. (C) Prescribe broad-spectrum antibiotics without identifying causative factors

Oral ulcerations in immunocompromised individuals can arise from infectious agents (bacterial, viral, or fungal), nutritional deficiencies, or autoimmune conditions. An Oral Medicine specialist carefully differentiates these etiologies through thorough lab investigations, including blood tests, microbiological assays, and nutritional evaluations. Prescribing antibiotics blindly overlooks targeted therapy and risks fostering resistant strains or missing critical diagnoses like viral opportunistic infections. Proper diagnostic measures guide tailored treatments, improve outcomes, and minimize complications. Hence, an unexplained ulceration merits a systemic and evidence-based approach rather than empirical broad-spectrum antibiotic prescriptions.

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11. (B) HIV infection

In patients with HIV, immunosuppression often predisposes them to opportunistic infections such as oral candidiasis. Salivary gland involvement, especially bilateral parotid enlargement, has been recognized as a hallmark of HIV-associated conditions. Additionally, reduced salivary flow can exacerbate xerostomia, promoting fungal proliferation. While Sjögren's syndrome is also linked to xerostomia and gland enlargement, HIV infection remains one of the more prevalent systemic etiologies for this triad. By identifying these oral manifestations early, clinicians can facilitate timely medical intervention and optimize both antiretroviral therapy and supportive oral care.

12. (B) Periodontal disease and delayed wound healing are possible indicators of poor glycemic control

Poorly controlled diabetes can manifest in the oral cavity through chronic periodontal inflammation, heightened risk of infection, and slower healing of mucosal wounds. Elevated blood glucose levels impair neutrophil function and microvascular circulation, contributing to persistent inflammation and infection risk. By keeping track of oral health status, dentists and other oral healthcare providers can identify early signs of insufficient glycemic regulation. Intervention strategies, including improved metabolic control and enhanced oral hygiene, help minimize complications. Conversely, ignoring these indicators may contribute to disease progression, underscoring the two-way relationship between oral health and diabetes.

13. (D) Diffuse melanoma-like pigmentation of the gingiva

Patients with chronic renal failure often exhibit distinct oral changes, including an ammonia or fishy odor (due to elevated urea levels), uremic stomatitis, and alterations in salivary composition that can lead to calculus formation. Such changes reflect the kidney's reduced capacity to excrete metabolic waste, affecting the chemical environment of the oral cavity. While variations in pigmentation can occur, a marked melanoma-like gingival discoloration is uncharacteristic of renal failure and more likely related to genetic predisposition or other systemic factors. Recognizing these common manifestations can aid early detection and prompt nephrology referral.

14. (A) Both Assertion and Reason are true, and the Reason is the correct explanation for the Assertion

Elevated thyroid hormone levels in hyperthyroidism heighten systemic metabolism and can alter immune and inflammatory pathways within the oral cavity. These changes, alongside potential modifications in salivary flow or composition, may promote bacterial growth and predispose individuals to dental caries and periodontal inflammation. Consequently, controlling hyperthyroidism can support better oral health outcomes. If not managed, chronic inflammation and possible changes in oral microflora may exacerbate periodontal disease progression and compromise tooth structure. Therefore, the increased metabolic rate does underlie the increased risk of oral disease in hyperthyroid patients.

15. (A) Anticoagulant medications

In a hypertensive patient, physicians frequently prescribe anticoagulants or antiplatelet agents to manage cardiovascular risks. These medications can lead to prolonged bleeding times and manifest as gingival bleeding, especially if the dosage is not adequately balanced. While vitamin C deficiency can cause gum problems, it does not specifically result in severely prolonged bleeding times. Leukemia and liver cirrhosis could present oral manifestations, but they often involve broader systemic signs and require distinct clinical correlations. Recognizing the impact of anticoagulation on oral bleeding is crucial for dental management in hypertensive individuals.

16. (B) Consultation with a rheumatologist for systemic management

Rheumatoid arthritis is a chronic inflammatory disease that affects multiple joints, including the temporomandibular joint, and can sometimes result in secondary oral ulcerations due to immunosuppressive medications or related autoimmune processes. Collaboration with a rheumatologist allows for optimization of systemic therapy, monitoring of immunomodulatory drugs, and coordinated management of flare-ups. While dermatologists may be consulted if skin lesions occur, focusing on the underlying autoimmune condition typically takes precedence. Surgical referrals are reserved for severe, refractory

joint damage. Integrating a rheumatologist's expertise ensures comprehensive care for both musculoskeletal and mucosal manifestations.

17. (C) Painful oral ulcers with erythematous halo

SLE is an autoimmune disease characterized by multi-organ involvement and immune complex deposition. In the oral cavity, it commonly presents as recurrent painful ulcers, often accompanied by an erythematous border, which can mimic other inflammatory conditions. Histopathological evaluation may show immunoglobulin deposits consistent with SLE. While keratotic lesions and gingival issues can appear in other conditions, painful erythematous ulcers remain a hallmark finding in SLE patients. Understanding these characteristic lesions allows clinicians to coordinate care with rheumatologists, modify immunosuppressive regimens if necessary, and ensure appropriate systemic and local interventions.

18. (D) Candidal overgrowth

Patients receiving long-term or high-dose corticosteroids experience immunosuppression and changes in oral microenvironment that favor fungal proliferation. Candidal species, notably Candida albicans, can thrive in this altered milieu, resulting in oropharyngeal candidiasis. Clinically, patients may complain of burning sensations, changes in taste, and white plaques that can sometimes be wiped away to reveal erythematous bases. Although opportunistic bacterial or viral infections may also occur, candidiasis is a prominent concern in immunocompromised individuals. Preventive strategies may include antifungal prophylaxis, vigilant oral hygiene, and close monitoring to mitigate complications arising from steroid therapy.

19. (B) Multiple aphthous-like ulcers

Celiac disease is an autoimmune condition triggered by gluten intake, primarily affecting the small intestine but also showing extraintestinal presentations. Recurrent aphthous-like ulcers can occur due to malabsorption-induced nutritional deficiencies and immune dysregulation. Such lesions may resemble common canker sores but could be more persistent or resistant to standard treatments. Recognition of this pattern can prompt gastrointestinal evaluation to confirm celiac disease. Once identified, a strict gluten-free diet can mitigate both intestinal and oral manifestations, underscoring the bidirectional nature of systemic and oral health in celiac patients.

20. (C) Serum cortisol and ACTH stimulation test

Addison's disease involves adrenal insufficiency, commonly leading to increased melanin production and hyperpigmentation, including dark patches on the oral mucosa. Measuring serum cortisol levels, both basal and after ACTH stimulation, confirms adrenal insufficiency. If cortisol fails to rise adequately following synthetic ACTH administration, it signifies inadequate adrenal reserve. This test is pivotal in distinguishing Addison's from other conditions that may present with mucosal pigmentation. While thyroid and liver function tests provide other systemic insights, they do not directly diagnose Addison's disease, which is driven by primary adrenal dysfunction.

21. (B) Vitamin B12 deficiency

Vitamin B12 deficiency often presents with atrophic glossitis, reflected by a smooth, erythematous tongue and a burning sensation. Individuals on strict vegan diets may lack sufficient dietary B12, as this vitamin is predominantly found in animal-based foods. Systemic manifestations include fatigue, neurological disturbances, and fragile nails. While iron deficiency also causes glossitis, B12 deficiency more commonly produces a burning oral sensation along with neurological complications. Therefore, identifying and correcting this deficiency through supplementation or dietary modifications can resolve oral and systemic symptoms, demonstrating the interplay between nutrition and oral health.

22. (C) Chronic liver disease–related coagulopathy

Chronic hepatitis B can progress to cirrhosis, impairing the liver's synthetic capacity for clotting factors. Consequently, these patients develop coagulopathies manifesting as prolonged prothrombin time (PT), thrombocytopenia from hypersplenism, and mucosal bleeding such as gingival hemorrhage. While immune thrombocytopenic purpura or aplastic anemia might present with similar oral findings, the direct link to advanced liver dysfunction in a known hepatitis B patient makes coagulopathy more likely.

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Recognizing this cause-and-effect relationship guides appropriate management, emphasizing control of liver disease and supportive measures like vitamin K or platelet transfusions to mitigate bleeding.

23. (C) Cobblestone appearance of the buccal mucosa with ulcerations

Crohn's disease can affect the entire gastrointestinal tract, and oral manifestations often reflect disease activity. A cobblestone appearance of the buccal mucosa with fissures and ulcerations is notably characteristic of Crohn's-related inflammation. These lesions can become painful and, if untreated, lead to secondary infections. Recognizing these oral changes helps detect subclinical or early flare-ups, enabling timely escalation of immunosuppressive therapy or other interventions. Lesser findings like linea alba or mild dryness may not necessarily indicate active disease. Hence, the distinctive cobblestone mucosa raises a red flag for potential gastrointestinal exacerbation.

24. (B) Acromegaly

In acromegaly, excessive growth hormone secretion (usually due to a pituitary adenoma) continues after epiphyseal plate closure, leading to tissue overgrowth. The tongue enlarges (macroglossia), often developing scalloped edges from chronic pressure against the teeth. Patients might experience dysphagia and speech difficulties resulting from the enlarged tongue. Hypothyroidism can also cause a mildly enlarged tongue, but the marked changes and systemic features such as enlarged hands, protruding jaw, and coarse facial features point toward acromegaly. Early recognition and medical or surgical management targeting the pituitary source can reduce morbidity.

25. (D) Lemon-yellow mucosal tint

Although both pernicious anemia and iron deficiency anemia share features such as pallor and atrophic glossitis, patients with pernicious anemia frequently exhibit a distinct lemon-yellow discoloration of the skin and mucous membranes. This hue arises from elevated bilirubin levels due to increased red blood cell turnover. Koilonychia is more specific to iron deficiency, while burning tongue can appear in both conditions. Recognizing the difference in coloration aids clinicians in distinguishing pernicious anemia, associated with B12 malabsorption, from iron deficiency anemia, which typically results from inadequate dietary intake or chronic blood loss.

26. (B) Improve glycemic control through medication and diet

Candidal overgrowth in the oral cavity is often linked to hyperglycemia, which creates a favorable environment for fungal proliferation. By controlling blood sugar via appropriate medication adjustments and dietary management, salivary glucose levels decrease, reducing the fungal load and minimizing recurrence of oral thrush and angular cheilitis. While mouthwashes and better oral hygiene practices can alleviate symptoms, they address only the superficial aspects of infection. Restricting water intake is counterproductive, and rigorous brushing alone does not target the underlying metabolic imbalance. Therefore, optimizing glycemic control is critical for long-term resolution.

27. (C) Gingival hyperplasia

Phenytoin-induced gingival overgrowth is a well-documented adverse effect of long-term antiepileptic therapy. This hyperplasia can be generalized, with fibrotic, thickened gingiva that may obscure tooth surfaces and increase periodontal pocket depth. Poor oral hygiene exacerbates the condition, and in severe cases, surgical reduction might be required. While alveolar bone changes, TMJ disorders, and autoimmune conditions can occur in different contexts, phenytoin's primary oral impact remains gingival overgrowth. Appropriate oral hygiene measures and regular dental evaluations help manage this complication, and adjusting medication in consultation with a neurologist can reduce severity.

28. (B) Pemphigus vulgaris

Pemphigus vulgaris is an autoimmune blistering disorder characterized by autoantibody-mediated destruction of desmoglein proteins within keratinocytes. This loss of cell-cell adhesion manifests as suprabasal acantholysis, resulting in fragile intraepithelial blisters. Oral mucosal involvement is often the earliest and most persistent manifestation, appearing as painful erosions or bullae. In contrast, bullous pemphigoid involves

subepithelial blister formation, while erythema multiforme and lichen planus have different immunopathological mechanisms. Recognizing pemphigus vulgaris early is essential for initiating immunosuppressive therapy and reducing potentially severe mucocutaneous complications.

29. (C) Fabrication of mouth-opening devices and physical therapy exercises

Systemic sclerosis (scleroderma) often causes collagen deposition in soft tissues, leading to reduced mouth opening (microstomia) and compromised oral function. A key management approach includes interventions to maintain or improve oral aperture, such as mouth-opening devices (oral orthotics) and targeted jaw exercises. This strategy helps prevent further restriction and facilitates oral hygiene and dental treatment procedures. Repeated surgical biopsies are only indicated if suspicious lesions arise, while extractions of posterior teeth may worsen functional limitations. Proper physical therapy can preserve mandibular mobility and enhance patients' quality of life in systemic sclerosis.

30. (D) Idiopathic thrombocytopenic purpura (ITP)

ITP is characterized by autoantibody-mediated platelet destruction, which results in thrombocytopenia. Consequently, patients may develop mucosal bleeds, including oral bullae and gingival bleeding from minimal trauma. Unlike hereditary coagulopathies like Hemophilia A or von Willebrand disease, ITP can present later in life and often manifests with isolated thrombocytopenia. Thalassemia minor typically involves mild anemia but not severe bleeding tendencies. Recognizing spontaneous or easily provoked bleeding in the oral cavity is a red flag that prompts hematological investigation for conditions such as ITP, ensuring prompt and appropriate management.

31. (B) Oral candidiasis

Patients with chronic obstructive pulmonary disease often require prolonged inhaled or systemic steroids, which predispose them to fungal overgrowth due to immunomodulation and altered oral flora. Erythematous palatal lesions that bleed easily are typical of candidal infection. Although histoplasmosis and cytomegalovirus can affect immunocompromised individuals, these infections are less common than candidiasis in COPD patients on steroids. Actinomycosis usually presents as indurated masses or sinus tracts rather than diffuse erythematous lesions. Recognizing oral candidiasis in medically compromised patients helps guide antifungal therapy, improving both oral comfort and overall quality of life.

32. (A) Direct infiltration by leukemic cells

In chronic myeloid leukemia, overproduction of abnormal myeloid cells can infiltrate various tissues, including gingiva, leading to hyperplastic overgrowth. Petechiae may arise from thrombocytopenia caused by marrow overrun with leukemic cells. Tyrosine kinase inhibitors help manage CML but do not fully eliminate infiltration in some cases. Hypersensitivity reactions or minor trauma alone do not commonly cause generalized gingival enlargement. Although medications might cause dryness, the hallmark in CML is tissue infiltration by malignant cells. Recognizing this pathophysiology is essential for comprehensive treatment and ongoing hematologic evaluation.

33. (A) Both Assertion and Reason are true, and the Reason is the correct explanation for the Assertion

The oral mucosa undergoes continuous epithelial turnover and is well vascularized, making it susceptible to early changes from underlying systemic disorders. This dynamic environment can reveal immune, nutritional, or endocrine imbalances before they manifest overtly in other tissues. Clinicians who carefully monitor oral tissues can often detect subtle abnormalities, such as unusual pigmentation or recurrent ulcerations, that prompt timely medical investigations. By acknowledging this association, dental professionals and physicians can collaborate for earlier diagnoses of systemic diseases, potentially improving prognosis and patient outcomes. Thus, the rich vascular supply underlies early manifestation of disease signs.

34. (C) Medications can induce xerostomia, gingival hyperplasia, or taste alterations

In managing patients with cardiovascular or psychiatric conditions, awareness of pharmacotherapy is crucial because certain medications contribute to significant oral side effects. Calcium channel blockers and antiepileptics

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may cause gingival overgrowth, tricyclic antidepressants can reduce salivary flow, and ACE inhibitors sometimes alter taste perception. Such adverse effects can compromise oral hygiene, predispose to infections, and reduce patient comfort. By noting the full medication history, Oral Medicine specialists can anticipate these risks, tailor oral care regimens, and collaborate with prescribing physicians to optimize drug regimens while safeguarding oral health.

35. (C) Initiating systemic corticosteroid therapy without a confirmed diagnosis

Sarcoidosis is a multisystem granulomatous disorder that frequently involves the lungs, lymph nodes, and occasionally oral tissues. Diagnostic steps include serum ACE testing, imaging studies (chest radiography), and histopathological confirmation through biopsy, which typically shows non-caseating granulomas. While systemic corticosteroids are often the mainstay treatment, commencing therapy prematurely, without definitive confirmation, can mask underlying pathologies and lead to misdiagnosis. Therefore, identifying the exact etiology is essential prior to beginning immunosuppressive treatment. This ensures targeted management and avoids unnecessary exposure to corticosteroid side effects.

36. (A) Systemic corticosteroids

Oral lichen planus is often treated with immunomodulatory agents, including corticosteroids for severe or widespread lesions. However, in patients with uncontrolled hypertension, systemic corticosteroids can exacerbate blood pressure elevation and fluid retention. This risk necessitates close collaboration with the patient's physician to optimize antihypertensive therapy and evaluate the risk-benefit ratio of corticosteroid use. Topical treatments, such as local anesthetic mouthwashes or chlorhexidine rinses, pose less systemic impact. Identifying potential complications helps develop a careful, personalized treatment plan that controls oral symptoms without significantly jeopardizing cardiovascular stability.

37. (B) Autoimmune pathways contributing to intestinal inflammation can also trigger oral mucosal ulceration

Inflammatory bowel diseases, such as Crohn's disease and ulcerative colitis, involve dysregulated immune responses primarily targeting the gastrointestinal tract. However, similar inflammatory mechanisms may affect the oral mucosa, resulting in recurrent aphthous ulcers. Additionally, malabsorption and nutrient deficiencies can worsen mucosal integrity, exacerbating lesion development. While improper oral hygiene or excessive brushing can irritate oral tissues, they do not fully explain the prevalence of aphthous ulcers in IBD. Thus, immune-mediated processes, combined with the possibility of nutritional compromise, underscores the link between gut inflammation and recurring oral ulcerations.

38. (B) Antifungal therapy and supportive mouth rinses

Chemotherapy-induced immunosuppression predisposes patients to opportunistic infections like oral candidiasis (pseudomembranous patches) and severe mucositis. Combining topical or systemic antifungals (e.g., nystatin or fluconazole) with supportive measures like non-irritating mouth rinses can alleviate symptoms and control microbial overgrowth. While antibiotics may be necessary if bacterial superinfection is suspected, prioritizing antifungal therapy addresses the most common pathogen in immunocompromised patients. Corticosteroids can further suppress immunity, potentially worsening infection. Saline irrigation provides symptomatic relief but lacks the antifungal properties essential for resolving pseudomembranous lesions. Prompt, targeted management is vital to improve comfort and prevent systemic complications.

39. (C) Xerostomia leading to increased caries risk

Sjögren's syndrome is an autoimmune disorder primarily targeting exocrine glands, such as the salivary and lacrimal glands, resulting in dry mouth (xerostomia) and dry eyes (xerophthalmia). Reduced salivary flow compromises natural oral cleansing and buffering functions, elevating the risk of dental caries, periodontal disease, and oral infections like candidiasis. Managing xerostomia includes saliva substitutes, frequent hydration, and meticulous oral hygiene. Although other conditions may produce vesiculobullous lesions or hypersalivation, Sjögren's hallmark is salivary hypofunction. Recognizing this association aids in early diagnosis, collaborative

rheumatologic referral, and prevention of further oral complications.

40. (D) Excessive saliva production

End-stage renal disease frequently leads to alterations in salivary composition, including decreased flow, and patients often complain of a foul or uremic odor on the breath. Dysgeusia, or a metallic taste, is also common. Aphthous ulcers may appear due to a combination of immunosuppression, nutritional deficiencies, and altered oral environment. In contrast, excessive saliva production is rarely reported. Most patients experience either normal or reduced salivary secretion, exacerbating dryness and discomfort. Understanding these patterns helps ensure that oral symptoms are correctly attributed to renal failure and addressed appropriately.

41. (A) Daily chlorhexidine mouth rinse

Leukemic patients, especially those with neutropenia, are prone to oral infections that can potentially become systemic. Daily chlorhexidine mouth rinse possesses broad-spectrum antimicrobial properties and is effective in reducing oral bacterial load. Using abrasive whitening toothpaste could induce mucosal trauma, while intermittent antibiotic mouthwashes raise concerns about antibiotic resistance and are not typically indicated prophylactically. High-dose steroids can further suppress immune function, heightening infection risk. Therefore, a regular regimen involving chlorhexidine rinse, combined with diligent oral hygiene and close clinical monitoring, remains the cornerstone of infection prevention in immunocompromised individuals.

42. (C) Joint medical consultation for optimizing glycemic control

Uncontrolled diabetes exacerbates periodontal disease, elevating the likelihood of infections and diminishing wound-healing capacity. Merely employing local measures like scaling or antimicrobial rinses may provide temporary relief but do not address the underlying metabolic imbalance. By coordinating care with endocrinologists or primary physicians to enhance insulin therapy and stabilize blood glucose levels, the inflammatory burden in the oral cavity can diminish, improving treatment efficacy. This integrative approach ensures that both dental and systemic factors are appropriately managed. Full-mouth extractions are overly drastic unless teeth are non-restorable, underscoring the need for comprehensive care.

43. (B) Diffuse blue-gray discoloration of the mucosa

Thalassemia major patients often receive multiple transfusions, risking secondary iron overload if iron chelation therapy is insufficient. Excess iron deposition can cause a distinctive blue-gray hue in the oral mucosa or skin. While necrotizing ulcerative gingivitis and localized bone loss have multifactorial etiologies, they are not specific to iron overload. The observation of abnormal mucosal discoloration in a transfusion-dependent individual necessitates evaluation of iron parameters. Prompt recognition can facilitate timely chelation adjustments, reducing complications like organ damage and ensuring better overall quality of life.

44. (B) Use bland rinses, topical anesthetics, and cryotherapy during chemotherapy infusion

Chemotherapy-induced mucositis is a common, debilitating side effect among immunocompromised individuals. Oncology guidelines often propose bland mouth rinses (e.g., saline or sodium bicarbonate), topical anesthetics, and cryotherapy (ice chips) during infusion sessions to minimize mucosal damage. These measures reduce local inflammation and provide symptomatic relief without halting potentially life-saving chemotherapy. Prophylactic antibiotics are not universally indicated unless specific infections or risk factors are identified. Avoiding any oral care entirely is contraindicated, as gentle hygiene is vital for preventing secondary infections. Coordinating with oncology teams ensures an integrated approach to supportive care.

45. (C) Recurrent pyostomatitis vegetans with pustular lesions

Pyostomatitis vegetans is a rare but significant finding characterized by pustular eruptions on an erythematous base in the oral cavity, often correlating with inflammatory bowel diseases such as ulcerative colitis or Crohn's disease. This condition can present intermittently and is frequently resistant to conventional topical treatments. Identifying this distinct entity should prompt further investigation of the gastrointestinal tract, potentially revealing underlying mucosal inflammation. Common issues

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like halitosis or black hairy tongue may have alternative etiologies, including oral hygiene or specific microbial imbalances, making them less indicative of systemic GI disease.

46. (B) Scleroderma (systemic sclerosis)

Raynaud's phenomenon, sclerodactyly, and xerostomia are classic signs of scleroderma (systemic sclerosis), a connective tissue disorder characterized by collagen overproduction that affects multiple organ systems, including the skin, gastrointestinal tract, and salivary glands. Oral manifestations often feature microstomia, limited tongue mobility, and dryness that predisposes to dental caries and periodontal disease. While lupus and rheumatoid arthritis can share autoimmune features, the specific triad of Raynaud's phenomenon, sclerodactyly, and xerostomia is most strongly associated with systemic sclerosis. Early identification supports proactive management strategies to mitigate complications and maintain oral function.

47. (C) Local immunosuppression in the oropharynx facilitates fungal overgrowth

Inhaled corticosteroids reduce local immune defenses within the oropharynx, decreasing the capacity to keep opportunistic fungi at bay. Moreover, steroid residues on the mucosal surface create a conducive environment for Candida species to thrive. Proper inhaler technique, mouth rinsing after use, and periodic antifungal prophylaxis can help mitigate this risk. Although mechanical factors and changes in salivary flow may contribute, local immunosuppression remains the primary mechanism. Educating patients about post-inhalation rinsing and routine dental evaluations is essential for preventing and controlling thrush in individuals with COPD.

48. (A) Mucormycosis

Mucormycosis (zygomycosis) is a rapidly progressing fungal infection, frequently seen in patients with poorly controlled diabetes, especially those with ketoacidosis. The fungus invades blood vessels, leading to necrosis of affected tissues. Characteristic black eschar formations on the palate or nasal regions are alarming clinical indicators of this angioinvasive disease. Immediate diagnosis through clinical suspicion, imaging, and biopsy is critical, followed by urgent antifungal therapy (e.g., amphotericin B) and possible surgical debridement. Delay in intervention can be fatal. Neither tuberculosis nor necrotizing ulcerative gingivitis typically presents with black necrotic lesions at these sites.

49. (C) Use local hemostatic agents and coordinate with a hematologist for possible correction of clotting factors

Advanced liver cirrhosis can impair synthesis of clotting factors and reduce platelet count, elevating hemorrhage risk. Current guidelines recommend a collaborative approach with a hematologist to evaluate the patient's coagulation profile, potentially administer vitamin K, platelets, or fresh frozen plasma as needed, and implement meticulous local hemostatic techniques (e.g., sutures, gelatin sponges). Abruptly halting medications may destabilize other health conditions, and ignoring lab assessments could lead to uncontrolled bleeding. By aligning with hematology support, safe dental extractions can be performed while minimizing complications in cirrhotic patients.

50. (C) Excessive calculus buildup

GERD commonly leads to acid reflux that contacts the oral cavity and pharynx, potentially eroding tooth enamel—most noticeable on palatal surfaces of maxillary incisors. Patients may also experience throat irritation, chronic coughing, or a burning sensation. However, GERD does not typically induce excessive calculus formation, which is more closely tied to factors such as salivary pH, plaque retention, and oral hygiene habits. Recognizing dental erosion, oropharyngeal burning, and related symptoms aids in diagnosing GERD and prompts a referral for gastrointestinal evaluation or management.

51. (C) A collective term for functional and structural abnormalities affecting the TMJ and associated structures

Temporomandibular joint disorder (TMD) broadly encompasses dysfunctions of the masticatory muscles, the joint itself, or the supporting structures, including ligaments and the articular disc. Symptoms can range from pain and limited

jaw movement to clicking or locking sensations. TMD results from multifactorial causes: occlusal imbalances, trauma, parafunctional habits (like bruxism), or psychosocial stress. Acute infections, while possible, represent only one subset within the broader category of TMD. By recognizing TMD as an umbrella term rather than a singular disease, clinicians can adopt a multidisciplinary approach for precise diagnosis and management of various related pathologies.

52. (C) Articular disc

The TMJ's articular disc is a fibrocartilaginous structure positioned between the mandibular condyle and the temporal bone, helping distribute load and reduce friction during jaw movements. This disc moves in coordination with condylar translation and rotation. Its firm but flexible composition enables shock absorption and smooth articulation. Although the retrodiscal pad and synovial fluid both contribute to lubrication and cushioning, the disc remains the principal load-bearing interface. The articular eminence forms part of the temporal bone that guides condylar path but is not the main cushioning structure between condyle and fossa.

53. (B) They create excessive stress on the TMJ and masticatory muscles

Parafunctional activities such as bruxism subject the masticatory apparatus to unrelenting occlusal forces that exceed normal functional loads. Over time, these excessive forces strain the condyle-disc assembly and the supporting ligaments, contributing to microtrauma, inflammation, and discomfort. Continuous muscle overactivity can cause fatigue, tenderness, and myofascial pain, all of which intensify TMD symptoms. Although bruxism can alter occlusal equilibrium, it does not directly reduce synovial fluid nor stimulate nerve overgrowth. Instead, the root issue lies in prolonged mechanical stress, requiring interventions that address stress management, occlusal adjustment, and muscle relaxation strategies.

54. (D) Immediate open joint surgery for first-line treatment

Conservative TMD management aims to alleviate muscle hyperactivity, reduce joint loading, and address contributory psychosocial factors. Often, therapy involves occlusal splints (to redistribute bite forces), physiotherapy (e.g., jaw exercises, massage), and counseling to manage underlying stress or anxiety. Surgery, particularly open joint procedures, is reserved for chronic or severe cases where conservative treatments have failed, or where there is a clear surgical indication like advanced disc derangement or significant bony pathology. Hence, immediate open joint surgery as a first-line measure is not standard practice and is typically considered a last resort.

55. (B) With reduction, the disc relocates during jaw opening; without reduction, the disc remains displaced, limiting range of motion

In anterior disc displacement with reduction, the articular disc is initially displaced forward at rest but slides back into a normal articulating position upon mouth opening. Patients often experience a characteristic clicking sound but typically maintain near-normal range of motion. Conversely, without reduction, the disc remains displaced throughout mandibular movement, blocking full translation of the condyle. This usually leads to more pronounced limitation of mouth opening (locking) and persistent joint dysfunction. The distinction hinges on whether the disc can recapture its functional alignment during movement or remains malpositioned throughout.

56. (B) Audible click or pop during jaw movement

A distinctive click or pop frequently signifies anterior disc displacement with reduction, where the condyle slips beneath the displaced disc at a certain point in the opening cycle. Crepitus, on the other hand, generally relates to degenerative or arthritic changes rather than disc displacement alone. Severe restriction of opening to around 10 mm suggests a disc displacement without reduction or acute lock. Paresthesia in the lip region might reflect nerve involvement or other pathologies but is not a hallmark of disc displacement. Hence, a clear clicking sound during movement is the most fitting clinical indicator.

57. (B) Fabrication of a stabilization splint

For patients exhibiting bruxism-related TMD symptoms—particularly pain upon waking and restricted jaw mobility—the first-line intervention often involves a stabilization splint (night guard).

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Such appliances reduce harmful occlusal forces, alleviate muscle tension, and protect dental structures from attrition. TMJ surgery is only warranted if conservative management fails or if severe structural damage is evident. Replacing restorations blindly is unnecessary unless specific occlusal discrepancies demand correction. Antibiotics would be unwarranted unless an infection were diagnosed, which is not indicated by mere bruxism or morning jaw pain. Splint therapy remains the cornerstone initial approach.

58. (C) Jaw exercises and physical therapy

When imaging and clinical examination do not suggest serious structural damage—like advanced osteoarthritis or acute displacement requiring urgent intervention—conservative therapy is typically appropriate. Structured physical therapy protocols, including gentle stretching, heat application, and jaw movement exercises, help alleviate muscle spasm and improve joint function. This approach targets the muscular component of TMD, facilitating relaxation and gradual restoration of range of motion. Immediate occlusal equilibration is not advised unless there is clear occlusal discrepancy linked to TMD. Surgical options, such as arthrotomy, are generally reserved for persistent cases unresponsive to less invasive measures.

59. (D) Delaying treatment for weeks to "see if it settles on its own"

Acute TMJ dislocation often results when the condyle translates excessively beyond the articular eminence and becomes locked anteriorly. Prompt manual reduction under suitable analgesia or sedation can reposition the condyle. Muscle relaxants may help ease associated spasms, facilitating successful reduction. Physical therapy ensures improved joint stability and muscle coordination after the dislocation is resolved. Conversely, delaying treatment for weeks allows the condyle to remain displaced, risking soft-tissue damage, increased inflammation, and chronic dysfunction. Early intervention is key to preventing complications and restoring normal mandibular movement.

60. (D) Gallbladder disease

Temporomandibular disorders can arise from or be exacerbated by systemic inflammatory conditions (like rheumatoid arthritis), generalized pain syndromes (fibromyalgia), or hormonal variations (as some studies suggest a possible link between estrogen levels and TMJ ligaments). These factors can influence joint health, pain perception, and muscle function, potentially intensifying TMD symptoms. However, gallbladder disease does not directly affect the masticatory system or TMJ structures. While systemic illnesses may have wide-reaching effects, gallbladder disorders typically manifest with gastrointestinal symptoms rather than orofacial issues, making them an unlikely contributor to TMD pathogenesis.

61. (B) Arthrocentesis is minimally invasive fluid lavage; arthroscopy utilizes an endoscope for direct visualization

In TMD management, arthrocentesis involves introducing needles into the upper joint space to lavage and manipulate the joint, relieving adhesions and improving disc mobility. It is relatively simple, minimally invasive, and cost-effective. Arthroscopy employs an endoscope to directly visualize intra-articular structures, allowing for targeted interventions—like removing adhesions or debriding inflamed tissue—while viewing the joint on a monitor. Open surgery is more invasive and typically reserved for advanced pathologies or when less invasive methods fail. Distinguishing arthrocentesis from arthroscopy highlights how both procedures can manage TMD, though arthroscopy offers greater diagnostic insight.

62. (B) Stress, anxiety, and depression can exacerbate muscle tension and perceived pain

TMD symptomatology often intensifies when patients face emotional stress or psychological strain. Anxiety and depression contribute to hyperactivity in the masticatory muscles, leading to jaw clenching or bruxism, which inflames the TMJ and surrounding tissues. While structural abnormalities and occlusal issues also factor into TMD, psychosocial components can significantly worsen pain perception and hinder recovery if unaddressed. Behavioral strategies, counseling, and stress management frequently complement physical or dental interventions. Thus, purely attributing TMD to anatomic causes overlooks the impactful contribution of emotional well-being on pain experience and muscle tension.

63. (B) Muscle relaxants, physical therapy, and stress management

For TMD patients primarily experiencing muscular pain, an integrative approach is recommended. Muscle relaxants can alleviate spasms, while physical therapy techniques (e.g., stretching, manual massage, ultrasound) promote muscle healing and improved range of motion. Stress management addresses potential psychosocial contributors like anxiety or clenching habits. Significant occlusal reshaping or invasive surgery is not standard for mild disc displacement unless other modalities fail. NSAIDs alone may reduce inflammation temporarily but do not resolve underlying myofascial dysfunction or stress-related factors. Adopting a comprehensive, conservative strategy ensures the best long-term functional and symptomatic improvements.

64. (B) Stabilization splint and home exercises

In a mild disc displacement scenario where the disc reduces spontaneously, the condition often responds well to conservative interventions. A stabilization splint (sometimes called a bite guard) helps reposition the mandible, protect teeth, and reduce joint stress. It may also diminish bruxism if present. Simple home exercises (e.g., gentle opening-closing movements, controlled jaw stretches) can further reduce muscle tension and improve disc-condyle coordination. Steroid injections or invasive surgery, such as arthrotomy, are typically reserved for severe pain or structural damage. Extraction of posterior teeth lacks rationale without proven occlusal pathology.

65. (C) Occlusal splint plus targeted physiotherapy

Chronic stress, bruxism, and muscle tenderness point toward a myofascial component in TMD. Occlusal splint therapy helps redistribute forces, prevents tooth wear, and offers muscle relaxation overnight. Supplementary physiotherapy targets masticatory muscle strengthening, stretching, and posture corrections, reducing pain and guarding. NSAIDs can continue as needed but do not suffice as the sole remedy for chronic bruxism-induced TMD. Surgery is unwarranted in the absence of advanced structural pathology, and full mouth rehabilitation is excessively invasive without conclusive evidence of significant occlusal discrepancies. Thus, a splint and physiotherapy remain the most logical initial approach.

66. (B) Sudden, severe, electric-shock-like episodes of facial pain

Trigeminal neuralgia typically presents as intense, brief, lancinating pain attacks affecting one or more branches of the trigeminal nerve. Even minor stimuli—like light touch, chewing, or cool air—can trigger these excruciating "electric" jolts. The pain commonly occurs in the maxillary or mandibular divisions, often leading patients to avoid normal activities out of fear of provoking an attack. Bilateral throbbing headaches or chronic earaches suggest alternative conditions, such as migraine or referred otologic pain. Recognizing this characteristic paroxysmal facial pain is crucial for accurate diagnosis and for initiating appropriate pharmacological or surgical management.

67. (B) Maxillary (V2)

Although trigeminal neuralgia can affect any division of the trigeminal nerve, clinical data frequently point to the maxillary (V2) branch as commonly involved, followed by the mandibular (V3). The ophthalmic (V1) branch can also be affected but is less prevalent in classic trigeminal neuralgia. Cervical nerves, like C2, are not part of the trigeminal system and govern sensation in the neck and posterior scalp. Distinguishing which branch is implicated helps target diagnostic evaluations (e.g., imaging to rule out compressive lesions) and guide interventions, including nerve blocks or microvascular decompression surgeries.

68. (B) The disease predominantly involves demyelination in trigeminal sensory roots, causing hyperexcitable neuronal firing

Trigeminal neuralgia is often linked to focal demyelination of sensory fibers near the root entry zone, frequently due to vascular compression. This demyelination induces erratic, high-frequency firing, manifesting as sudden bursts of severe pain. Because the discharges are abrupt and short-lived, patients commonly report sharp, stabbing episodes instead of prolonged, throbbing discomfort. Psychological factors may exacerbate the perception of pain but do not solely create its pathophysiology. The

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hallmark feature is intermittent hyperexcitability from the trigeminal nerve's demyelinated segments, explaining the intense, electric-shock-like nature of classical trigeminal neuralgia attacks.

69. (C) Ongoing bilateral tension-like headache for several hours

Trigeminal neuralgia is characterized by paroxysmal, unilateral facial pain attacks evoked by trivial stimuli such as touch, smiling, or chewing. These episodes last from a few seconds to a couple of minutes but can recur repetitively in clusters. The pain is localized to one trigeminal division or multiple divisions on the same side. Bilateral, continuous, tension-type headaches that persist for hours do not align with the abrupt, shock-like nature of trigeminal neuralgia. Identifying these distinct patterns helps differentiate trigeminal neuralgia from other headache disorders, enabling targeted therapy (e.g., carbamazepine or microvascular decompression).

70. (B) Atypical facial pain is typically dull, continuous, and poorly localized rather than sharp, intermittent

Atypical facial pain, sometimes called persistent idiopathic facial pain, usually presents as a diffuse, dull ache that may lack clear neuroanatomical boundaries. It can persist for long periods, contrasting with the sudden, electric paroxysms seen in trigeminal neuralgia. Classic trigeminal neuralgia is usually unilateral, triggered by specific stimuli, and sharply demarcated within one or more trigeminal nerve divisions. While atypical facial pain can cross midlines or have no specific trigger, trigeminal neuralgia is strictly unilateral and often follows a distinctive pattern. Thus, the continuous, vague nature sets atypical facial pain apart from classic neuralgia.

71. (A) Carbamazepine

Carbamazepine is the cornerstone pharmacotherapy for classic trigeminal neuralgia. Its action on sodium channels helps stabilize neuronal hyperexcitability, reducing the frequency and intensity of abrupt pain bursts. While ibuprofen and other NSAIDs can alleviate general discomfort or inflammation, they seldom provide substantial relief in trigeminal neuralgia. Amitriptyline is better suited for chronic neuropathic or atypical facial pain but not the abrupt, shock-like attacks typical of trigeminal neuralgia. Ketoconazole has antifungal properties and is irrelevant to neuralgia management. Clinicians typically start with carbamazepine for diagnostic and therapeutic purposes, adjusting dosage for optimal pain control.

72. (A) Increase carbamazepine dose or add adjunct anticonvulsant

In refractory trigeminal neuralgia, optimizing or escalating the current drug regimen is a rational step before considering invasive procedures. Clinicians may increase carbamazepine within safe therapeutic levels, or add another medication like oxcarbazepine or baclofen to enhance pain control. Abrupt discontinuation without a proper alternative leaves the patient vulnerable to unrelieved pain, and antibiotics are not indicated. TMJ arthroscopy is unnecessary unless there is concurrent TMJ pathology. Excision biopsy of the trigeminal ganglion is an extreme measure that poses significant morbidity and is typically reserved for exceptional, treatment-resistant cases.

73. (B) Pain triggered by gentle touch over a specific trigger zone

Neuralgic pain, such as that from trigeminal neuralgia, often arises from light tactile stimulation of distinct trigger zones (e.g., the upper lip, cheek, or gingiva). This hallmark feature underscores hyperexcitability in sensory nerve pathways rather than muscular inflammation. By contrast, myofascial or muscular pain tends to worsen on palpation of the involved muscle bellies or during mastication, and it typically responds to therapies targeting muscle relaxation. Trigger zone sensitivity that ignites sharp, electric-like jolts is essentially a neuralgic phenomenon, prompting investigations into trigeminal nerve involvement rather than muscular disorders.

74. (D) High-dose antibiotics regimen

In advanced or drug-resistant trigeminal neuralgia, procedural interventions can disrupt pain-transmitting fibers or relieve vascular compression on the trigeminal nerve. Microvascular decompression, glycerol rhizolysis, and alcohol nerve blocks each target the trigeminal nerve's pathological activity. Antibiotics, however, have no established role in

managing trigeminal neuralgia unless a concurrent infection is identified, which is rare. High-dose antibiotic therapy does not address the underlying demyelination or vascular compression. Thus, while minimally invasive rhizotomies and surgical decompression are recognized escalations for intractable trigeminal neuralgia, antibiotic regimens remain outside typical treatment protocols.

75. (A) Cluster headache usually presents with unilateral periorbital pain and autonomic symptoms

Cluster headaches feature excruciating unilateral peri- or retro-orbital pain accompanied by autonomic manifestations, such as lacrimation, nasal congestion, or ptosis. Their cyclical occurrence in "clusters" often follows circadian rhythms, but the pain quality differs from trigeminal neuralgia's sudden, electric shocks. Trigeminal neuralgia typically focuses on facial regions innervated by trigeminal branches and can be triggered by minor activities (chewing, speaking, or light touch). Cluster headaches also last longer—often 15 minutes to 3 hours—than the fleeting jolts of trigeminal neuralgia. Thus, the hallmark autonomic signs around the eye region characterize cluster headaches, distinguishing them from neuralgic attacks.

76. (B) Superior cerebellar artery

Neurovascular compression at the root entry zone of the trigeminal nerve is a frequent cause of classic trigeminal neuralgia. In many cases, an ectatic loop of the superior cerebellar artery contacts or compresses the trigeminal nerve, provoking demyelination and pathological hyperexcitability. Although other arteries or veins may occasionally be involved, the superior cerebellar artery remains the most commonly cited culprit. Surgical microvascular decompression addresses this compression by placing a spacer between the nerve and the vessel, often leading to substantial or complete pain relief. Early identification aids targeted intervention and symptom management.

77. (A) Both Assertion and Reason are true, and the Reason is the correct explanation for the Assertion

Involvement of the inferior alveolar nerve, a branch of the mandibular division (V3), can present as toothache-like pain in the lower jaw. Such neuropathic pain may be mistaken for pulpitis or periapical pathology, particularly when localized around posterior teeth. Without appropriate imaging, clinicians may miss the absence of pulpal or periapical lesions and incorrectly pursue endodontic or extraction interventions. Hence, thorough diagnostic workup—clinical testing, radiographs, and possibly a neurosensory evaluation—is critical to differentiate neuropathic pain from true dental disease. This explains why nerve involvement can mimic odontogenic origins and underscores the importance of comprehensive radiographic analysis.

78. (C) Carbamazepine

Sharp, stabbing facial pain triggered by trivial stimuli strongly suggests trigeminal neuralgia. Although MRI helps exclude mass lesions, the absence of detectable pathology does not negate classic neuralgia. Carbamazepine stands as the gold standard initial pharmacotherapy for trigeminal neuralgia, often delivering significant symptom relief by stabilizing hyperactive neuronal firing. NSAIDs may offer minimal comfort for inflammatory or musculoskeletal pain but do little to quell abrupt neuralgic attacks. Steroids are seldom first-line for trigeminal neuralgia unless there is concurrent inflammatory pathology. Antibiotics target infections and are not indicated when imaging and clinical findings favor neuralgia.

79. (B) Collaborative care between neurology, oral medicine, and pain specialists

Neuropathic craniofacial pain disorders, such as trigeminal neuralgia or persistent idiopathic facial pain, may require complex management that extends beyond routine dental care. Neurologists can assess and optimize nerve-focused pharmacotherapy (e.g., anticonvulsants), while pain specialists can offer advanced modalities like nerve blocks, radiofrequency ablation, or targeted therapies. Oral Medicine professionals are integral to ruling out dental or orofacial causes and to coordinating interventions. Dermatologists or cardiologists may be consulted if additional pathologies arise, but the core synergy lies between neurology, oral medicine, and dedicated pain clinics for optimized patient outcomes.

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80. (A) Possible metastatic infiltration of trigeminal nerve

Cancer patients who develop new-onset or persistent facial numbness and neuralgic discomfort warrant thorough evaluation for metastatic spread. Certain malignancies, including breast and lung cancers, can metastasize to the skull base or along cranial nerves, causing trigeminal neuropathy. While sinusitis, TMD, and migraines may explain some craniofacial pain, they usually do not produce isolated numbness aligned with a nerve distribution in a patient with known cancer. Advanced imaging, such as MRI, can help detect perineural infiltration or bone lesions. Early identification of metastatic disease is critical for timely oncologic and supportive treatment strategies.

81. (B) An inflammatory condition of the salivary gland

Sialadenitis refers to inflammation of a salivary gland, often caused by infection (bacterial or viral) or by obstructive factors like sialoliths that restrict salivary flow. Common presentations include pain, swelling, and tenderness in the affected gland—commonly the parotid or submandibular. While sialadenitis can be triggered by dehydration, immunosuppression, or decreased saliva production, it differs from neoplastic processes, which involve abnormal cellular proliferation. Although salivary duct calcifications (sialoliths) may contribute to gland inflammation, they do not solely define sialadenitis. Excessive salivation, or sialorrhea, represents a distinct phenomenon unrelated to primary gland inflammation.

82. (C) Submandibular gland

Submandibular glands account for the majority of salivary calculi due to the thicker, more alkaline nature of their saliva and the uphill duct path (Wharton's duct) draining into the oral cavity. The parotid gland may also develop sialoliths but less frequently compared to the submandibular. Sublingual gland or minor salivary gland stones are relatively rare. These stones can lead to obstructive sialadenitis, manifesting as painful swelling, especially during mealtimes when saliva production peaks. Prompt detection and removal of the stone often alleviate discomfort and prevent chronic glandular damage or infection.

83. (B) It concentrates saliva, facilitating bacterial growth and stone formation

When a person is dehydrated or has chronically low fluid intake, salivary flow diminishes and the saliva itself can become more viscous. Thicker saliva, with reduced washing action, enhances the likelihood of mineral precipitation and bacterial colonization. Consequently, salivary stones may develop more readily, potentially obstructing ducts and causing painful inflammation. Furthermore, lower salivary volume decreases its natural antimicrobial capacity, leaving the gland more susceptible to infection. While severe chronic dehydration might ultimately impair salivary gland function, immediate atrophy of the gland does not occur, and hypertrophy of ducts is not a typical response.

84. (D) Bilateral, painless swelling with no systemic symptoms

Acute bacterial parotitis often presents as unilateral painful swelling of the parotid gland, along with erythema, tenderness, and potentially purulent discharge at the parotid duct orifice (Stensen's duct). Patients commonly exhibit fever, malaise, and elevated inflammatory markers. Bilateral, painless gland enlargement is more consistent with viral parotitis (e.g., mumps) or certain systemic conditions (e.g., Sjögren's syndrome). Acute bacterial infections rarely remain pain-free or asymptomatic. Hence, when swelling is bilateral and lacks overt inflammatory signs or systemic involvement, alternative diagnoses beyond acute bacterial parotitis must be considered.

85. (B) Sjögren's syndrome is an autoimmune process causing chronic dryness, while acute sialadenitis is typically an infectious/inflammatory event

Sjögren's syndrome arises from autoimmune destruction of the exocrine glands, leading to persistent xerostomia and keratoconjunctivitis sicca. Its onset is insidious, and dryness symptoms commonly worsen over time. Conversely, acute sialadenitis often develops more quickly, spurred by bacterial or viral infections, ductal obstructions, or reduced salivary flow. It typically presents with acute glandular swelling, pain, and potential purulent discharge if bacterial. Sjögren's does not simply resolve spontaneously within days, nor is acute sialadenitis always painless. Therefore, the fundamental distinction lies in the chronic

autoimmune nature of Sjögren's versus the infectious etiology of acute sialadenitis.

86. (B) High-resolution ultrasound

For recurrent salivary gland swelling suggestive of ductal obstruction or sialolithiasis, high-resolution ultrasound is often the initial imaging modality. It is non-invasive, readily available, and effective at detecting stones, dilated ducts, or glandular structural changes. Panoramic radiographs can visualize large radiopaque calculi in the submandibular region but are less sensitive for parotid stones or radiolucent calculi. MRI with contrast can provide detailed soft-tissue resolution but is typically a second-line or problem-solving tool. Chest X-rays hold no direct relevance for salivary gland imaging. Ultrasound remains the practical, cost-effective first step in diagnostic evaluation.

87. (A) Conservative management with glandular massage and hydration; possibly ductal stone removal if accessible

A small sialolith in the submandibular duct (Wharton's duct) typically manifests as mealtime pain and swelling that decompresses afterward. Stones of manageable size can often pass spontaneously or be manually expressed with gland massage or by increasing hydration and salivary stimulation (e.g., sour candies). If the stone is accessible near the duct orifice, it may be removed under local anesthesia. Total submandibular gland excision is reserved for large or recurrent stones, or complicated disease. Antibiotics are employed only if infection arises, while malignancy suspicion demands a biopsy, not routine for simple sialolithiasis.

88. (B) Use of artificial salivary substitutes and sialogogues

Sjögren's syndrome impairs salivary flow, leading to xerostomia, difficulty speaking or swallowing, and increased caries risk. First-line symptom relief often involves saliva substitutes (artificial sprays or gels) and sialogogues (like pilocarpine or cevimeline) that stimulate residual salivary gland function. Regular hydration, meticulous oral hygiene, and potentially fluoride supplementation further guard against dental disease. Immediate parotidectomy is unwarranted without a localized pathology, and antibiotics do not address autoimmune gland damage. Tooth extraction is a last resort for severely decayed teeth but does nothing to alleviate dryness, underscoring the importance of stimulants and lubricants.

89. (B) Facial nerve weakness and purulent discharge

Although obstructive sialolithiasis can cause swelling and pain—especially around mealtime—persistent facial nerve dysfunction (due to inflammation or compression) and the presence of purulent discharge at Stensen's duct strongly indicate an active infection. In straightforward sialolithiasis, episodes of swelling often fluctuate, and no significant purulence is typically observed unless secondary infection sets in. The detection of a solitary stone on ultrasound points more to mechanical obstruction rather than an acute infection. Facial nerve weakness also highlights the severity of inflammatory involvement in the parotid region, reinforcing suspicion of an acute bacterial process.

90. (D) Complete gland excision immediately in all cases

Treatment of acute bacterial sialadenitis usually includes antibiotics effective against oral or skin flora (commonly Staphylococcus aureus), along with supportive measures such as warm compresses, gentle massage to enhance drainage, and sufficient fluid intake. Sialogogues (e.g., sour candies) promote salivary flow, helping flush out bacteria. Although surgical intervention may be necessary if there is an abscess or refractory disease, total gland removal is not the standard initial step. Immediate excision would be excessive for most acute infections that generally resolve with medical management. Only persistent or complicated cases might warrant more invasive surgical intervention.

91. (B) Identify and characterize pathological conditions in the craniofacial region

Imaging in Oral Medicine seeks to detect, localize, and assess diseases or abnormalities within the jaws, teeth, TMJs, salivary glands, and related soft tissues. Modalities like panoramic radiography, cone beam CT, and MRI furnish detailed anatomical information, enabling diagnosis and treatment planning. Although imaging greatly enhances diagnostic accuracy, it cannot replace a thorough

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clinical exam. Nor is it used solely for cosmetic insights. Invasive procedures (like biopsies) may still be required for definitive diagnoses, particularly when imaging reveals suspicious lesions requiring histopathological confirmation. Thus, imaging primarily supports comprehensive evaluation of orofacial pathologies.

92. (C) Cone beam computed tomography (CBCT)

Cone beam computed tomography (CBCT) produces three-dimensional reconstructions of maxillofacial anatomy with significantly less radiation exposure than standard medical CT scans. It is highly useful in implant planning, assessing impacted teeth, TMJ evaluations, and complex endodontic or orthodontic diagnostics. Panoramic radiographs and lateral cephalograms furnish two-dimensional images suitable for screening or orthodontic assessments, respectively. Ultrasonography excels in soft tissue imaging—particularly salivary gland evaluations—but has limited utility in detailed bony analyses. Therefore, CBCT's balance of lower dose and 3D detail makes it a favored modality for many Oral Medicine diagnostic applications.

93. (B) MRI offers superior soft tissue contrast without ionizing radiation

Magnetic resonance imaging (MRI) is particularly advantageous for assessing soft tissue pathologies due to its high contrast resolution and lack of ionizing radiation. It clearly delineates muscles, vascular structures, glandular tissues, and pathological masses, making it crucial for evaluating suspected neoplasms, TMJ disc displacement, or inflammatory processes. While CT remains beneficial for bony detail, it uses ionizing radiation and may be less adept at distinguishing subtle soft tissue changes. MRI cannot detect dental caries as precisely as conventional radiography or CBCT, but excels in characterizing soft tissue lesions or infiltration.

94. (C) Early detection of mucosal color changes

CBCT provides precise 3D visualization of bone and tooth structures, facilitating tasks like implant planning, evaluating impacted teeth, assessing periapical lesions, and guiding endodontic treatment. It does not, however, primarily reveal soft tissue color changes or superficial mucosal lesions. Such color variations (e.g., erythematous or white patches) require clinical inspection or other imaging modalities focusing on soft tissue (like MRI), and often a biopsy for definitive diagnosis. CBCT excels at skeletal detail, not subtle mucosal discolorations. Hence, while it is invaluable for bony analysis, its utility in detecting color changes is minimal.

95. (A) Panoramic captures an entire jaw overview, while periapical focuses on one or a few teeth in detail

Panoramic radiographs deliver a comprehensive view of both jaws, including the maxilla, mandible, TMJs, and surrounding structures. This broader field helps identify impacted teeth, large cystic lesions, or overall bone pattern. By contrast, periapical radiographs target a small region around a particular tooth or group of teeth, offering high-resolution detail for diagnosing periapical pathology or assessing root integrity. Both modalities are important, but they serve distinct clinical objectives. Periapical films are not limited to children; they remain vital for endodontic evaluations and suspected localized dental pathology in patients of all ages.

96. (B) MRI

MRI is highly sensitive in detecting early marrow edema and inflammatory changes before they become apparent on conventional radiographs or CT scans. In suspected osteomyelitis, MRI can reveal subtle alterations in bone marrow signal intensity, aiding prompt diagnosis and treatment. Panoramic or cephalometric radiographs might show advanced changes like periosteal reactions but are less sensitive to early disease. Sialography specializes in salivary duct imaging and is unrelated to identifying bone infections. Identifying osteomyelitis in its initial phases with MRI allows timely antibiotic intervention, potentially preventing extensive necrosis or pathological fractures.

97. (B) Cone beam computed tomography (CBCT)

When standard two-dimensional films (like periapical or panoramic radiographs) do not clarify the nature of suspected jaw lesions, CBCT often provides the necessary 3D detail for diagnosis. It surpasses 2D x-rays in detecting small cysts and their precise relationships to surrounding structures, and it delivers less radiation than a conventional

medical CT scan. MRI excels in soft tissue contrast but may be less definitive for small cystic lesions confined to bone. A radionuclide bone scan is more suited for detecting widespread bone pathology or metastatic disease, not localized cystic changes. Hence, CBCT is typically preferred.

98. (D) Administering high-dose iodinated contrast agent intravenously

MRI typically uses gadolinium-based contrast (if needed), not iodinated contrast agents. Iodinated contrast is used in CT scans rather than MRI. Evaluating TMJ disc position benefits from capturing dynamic positions (open-mouth and closed-mouth views), and specialized coils enhance resolution of small structures like the disc. T1- and T2-weighted sequences effectively assess soft tissue anatomy and joint effusions. Administering high-dose iodinated contrast is not a recognized protocol for MRI of the TMJ and could introduce unnecessary risk. Gadolinium offers better compatibility with MRI physics for highlighting vascularity or inflammatory changes in the joint.

99. (B) MRI with contrast to evaluate tumor extent and relationship to adjacent structures

While ultrasound can detect salivary lesions and guide fine needle aspiration, MRI with contrast remains the gold standard for thoroughly characterizing salivary gland tumors, particularly in the parotid or deep lobe regions. MRI clarifies whether the lesion is benign or malignant based on infiltration patterns and delineates potential perineural spread—key data for surgical planning. Plain skull radiographs and panoramic films lack the resolution and scope for soft tissue tumor evaluation. Thus, for a suspected tumor, Oral Medicine guidelines typically recommend MRI to ascertain size, vascularity, and infiltration risk, ensuring precise diagnostic and therapeutic strategies.

100. (B) MRI with contrast

A painless parotid swelling, especially if suspected to extend into the deep lobe or parapharyngeal space, warrants high-resolution soft tissue imaging. MRI with contrast is superior at delineating tumor borders, assessing local tissue infiltration, and identifying perineural spread along the facial nerve. Cone beam CT predominantly highlights bony architecture, while a panoramic radiograph offers only a broad overview of the jaws. A Technetium-99m bone scan pinpoints metastatic or inflammatory changes within bone, not soft tissue detail. Thus, MRI with contrast remains the best choice for mapping salivary gland tumor extent, guiding surgical resection, and safeguarding vital structures.

101. (B) A patient with systemic health issues affecting treatment planning

A "medically compromised patient" encompasses any individual whose systemic condition may alter their response to dental interventions or pose additional risks in routine procedures. This includes those with cardiovascular diseases, respiratory conditions, diabetes, bleeding disorders, immunosuppression, or other chronic medical illnesses. Dental management must be tailored carefully—taking into account specific medication use, potential drug interactions, and the patient's overall health status. By contrast, purely cosmetic concerns or straightforward pediatric care without underlying medical complexities do not fit the "medically compromised" classification. Recognizing this definition ensures safety and effective delivery of dental services in medically diverse populations.

102. (C) A history of infective endocarditis

Patients with a history of infective endocarditis fall under high-risk groups for subsequent episodes if bacteremia occurs, for instance, during invasive dental treatments. Current guidelines (e.g., American Heart Association) recommend prophylactic antibiotics for this population prior to procedures likely to cause significant gingival or periapical manipulation. Uncontrolled epilepsy, chronic kidney disease, or controlled asthma do not routinely mandate antibiotic prophylaxis in the absence of other risk factors. While these conditions may alter treatment strategies (e.g., sedation protocols, medication adjustments), they are not automatically eligible for prophylaxis. Hence, endocarditis history remains a specific indication for preventive antibiotic use.

103. (C) It indicates the degree of anticoagulation, guiding bleeding risk management

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Warfarin is a vitamin K antagonist that raises INR, reducing the blood's coagulation capability. Before extractions or other invasive dental procedures, dentists check the INR to judge if the patient's anticoagulation level is within a safe therapeutic range (often 2–3.5, depending on clinical circumstances). If the INR is excessively high, the risk of prolonged or uncontrollable bleeding grows, necessitating adjustments, such as dose reduction or consulting the prescribing physician. Conversely, an INR that is too low can compromise the primary medical reason for anticoagulation. Thus, INR testing is crucial in maintaining both hemostatic safety and therapeutic efficacy.

104. (C) Administering high concentrations of epinephrine indiscriminately

Patients with hypertension can experience dangerous spikes in blood pressure, especially in stressful environments. Recommended measures include early-day appointments (when cortisol levels are relatively lower), sedation or relaxation strategies to reduce anxiety, and vigilant blood pressure monitoring. Epinephrine-containing local anesthetics can be used with caution at lower, controlled doses to avoid significant cardiovascular stimulation. However, giving high concentrations indiscriminately raises the risk of hypertensive crises or cardiac complications. Hence, controlled use of vasoconstrictors is critical, alongside careful observation, to ensure safe delivery of dental care to hypertensive individuals.

105. (A) COPD patients may have difficulty reclining for long, while asthmatics need acute bronchospasm prevention

Asthma is typically characterized by reversible airway hyperreactivity, making prophylactic bronchodilator use and measures to prevent triggers (e.g., stress, allergens) important in the dental setting. On the other hand, chronic obstructive pulmonary disease (COPD) involves less reversibility, and advanced cases can leave patients unable to tolerate full supine positioning due to compromised lung capacity. COPD patients may need semi-upright posture, supplemental oxygen, or breaks to facilitate breathing. Asthmatics, however, more acutely risk bronchospasm if triggered by stress or irritants. While both conditions affect respiratory function, their management strategies differ significantly in the dental context.

106. (C) Checking blood glucose levels and ensuring the patient has taken medications and a meal

Patients with diabetes can experience significant fluctuations in blood glucose during dental procedures, particularly if they skip meals or delay medications. To minimize the risk of hypoglycemia or hyperglycemia, clinicians should confirm that the patient has eaten as usual and taken any prescribed antidiabetic medications (barring specific physician instructions). Additionally, chairside glucose monitoring before invasive or prolonged treatment adds a layer of safety. Fasting for 24 hours might be hazardous. Late-day appointments can coincide with inconsistent meal schedules. While use of vasoconstrictors is not absolutely contraindicated, precise glucose management remains paramount.

107. (A) Proceed as planned with treatment, monitoring for any hypoglycemic symptoms

A blood glucose level of 95 mg/dL in a diabetic patient, especially after breakfast, is well within a reasonable range for proceeding with dental procedures. Because the patient is neither hypoglycemic nor hyperglycemic, the standard approach would be to continue, while keeping glucose gel or a quick carbohydrate source on hand in case of unexpected hypoglycemia. Canceling the appointment or giving extra glucose without signs of low blood sugar can disrupt metabolic control. Doubling insulin would be dangerous. Monitoring for potential hypoglycemia remains prudent, ensuring safe, uninterrupted dental treatment.

108. (B) Consider steroid dose augmentation or "stress dose" per physician advice

Long-term corticosteroid use can suppress adrenal gland function, reducing the body's capacity to handle physiological stress. Dental extractions can be stressful enough to precipitate adrenal crisis. As a result, guidelines recommend consulting the patient's physician regarding possible adjustment or supplementation of steroids (often termed a "stress dose") before invasive procedures. Abrupt discontinuation of steroids invites withdrawal and potential adrenal crisis. Withholding anesthesia is unwarranted, and vital signs may not reliably

indicate adrenal insufficiency until an acute crisis develops. Therefore, coordinating with medical professionals ensures patient safety through appropriate steroid coverage.

109. (C) Scheduling invasive procedures during periods of maximal immunosuppression

Organ transplant recipients require lifelong immunosuppression to prevent rejection, making them highly vulnerable to infections. Coordinating with the transplant team is essential, confirming stable graft function and adjusting medications or antibiotics as needed. Invasive dental procedures are typically planned during periods of relative immunologic stability—often well after the immediate postoperative phase—so that infection risk is minimized. Performing procedures at the peak of immunosuppression unnecessarily raises complications. Maintaining meticulous oral hygiene and closely monitoring for any signs of infection or transplant rejection remain pivotal to preserving overall health in these patients.

110. (C) Administration of high-dose IV fluids to reduce fluid overload risk

In CHF, the heart struggles to pump effectively, leading to fluid accumulation. Overloading a patient with additional IV fluids could exacerbate pulmonary edema or peripheral congestion. Therefore, administering high-volume IV fluids is counterproductive. Short, stress-minimized appointments allow for better patient tolerance. Semi-upright positioning helps reduce respiratory distress by improving lung expansion. Monitoring blood pressure, heart rate, and oxygen saturation alerts the dental team to possible decompensation. Proper sedation or anxiolysis can further stabilize hemodynamics. Hence, introducing extra fluids is a false and dangerous measure for managing CHF patients in a dental setting.

111. (B) Unstable angina may contraindicate elective treatment, while stable angina permits controlled appointments

Angina pectoris reflects myocardial ischemia. "Stable" angina is predictable, often triggered by exertion, and manageable with rest or nitroglycerin. Patients with stable angina can typically undergo elective dental care, provided that appointments are stress-free and short, and that nitroglycerin is available chairside. Conversely, "unstable" angina involves unpredictable pain episodes, indicating a higher risk of significant cardiac events. Elective procedures in these patients are generally postponed until their cardiac condition stabilizes under medical supervision. IV sedation is not universally required for stable angina, nor are immediate major interventions indicated for either scenario.

112. (B) Gingival hyperplasia

Phenytoin, commonly used for seizure control, can induce gingival overgrowth. The hyperplasia typically appears as fibrotic, thickened tissue, often around the anterior gingiva. Regular professional cleanings and meticulous home hygiene (including effective plaque control) mitigate this side effect. While phenytoin can occasionally contribute to other oral issues (such as delayed healing or dryness), significant gingival overgrowth remains the primary concern, sometimes necessitating surgical excision if severe. Tooth mobility, transient ulcers, or hemangiomas have different etiologies. Recognizing phenytoin-induced gingival changes allows for timely interventions and better long-term oral outcomes.

113. (C) Treat on a non-dialysis day after consulting the nephrologist

Hemodialysis patients are at increased bleeding risk due to heparin used during dialysis and underlying platelet dysfunction. Elective invasive procedures shortly after a dialysis session could lead to prolonged bleeding because of residual anticoagulation. Conversely, performing extractions just before dialysis risks excessive bleeding during the procedure without quick access to dialysis resources. Ideally, scheduling on a non-dialysis day allows some normalization of coagulation parameters. Coordination with the nephrologist helps adjust anticoagulant or medication regimens if needed. Prophylactic antibiotics are selectively used based on infection risk and vascular access type, not automatically for all dialysis patients.

114. (C) Sit the patient upright, give low-flow oxygen, and allow rest

COPD patients often struggle with prolonged supine positioning and may develop acute shortness

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of breath. Reclining them completely can worsen breathing by reducing diaphragmatic movement. High-flow oxygen risks suppressing their respiratory drive if they rely on hypoxic stimulus for ventilation. Instead, gently seating the patient upright opens the airway and helps lung expansion. Administering controlled, low-flow oxygen (e.g., 2–3 L/min via nasal cannula) can alleviate hypoxia without suppressing respiratory drive. Pausing the procedure allows the patient to recover, diminishing anxiety-related hyperventilation. These measures prioritize patient safety and comfort, which is crucial in COPD management.

115. (D) Providing aerosol-generating treatments in a regular open clinic without respiratory precautions

Active TB poses a significant risk of airborne transmission, particularly during aerosol-generating dental procedures (e.g., ultrasonic scaling, high-speed drilling). Standard protocol involves deferring elective treatments until the patient completes an adequate course of anti-TB therapy and is considered non-infectious. If emergency care is unavoidable, strict infection control measures—N95 masks, negative-pressure isolation rooms, and minimal staff exposure—are mandated. High-volume suction and PPE reduce but do not eliminate risk. Scheduling appointments strategically (e.g., at day's end) can further protect other patients. Hence, performing procedures in a standard open clinic without special respiratory precautions is contraindicated.

116. (C) Vigorous, forced hyperventilation to reduce stress

Stress exacerbates cardiac workload by increasing heart rate and blood pressure. For anxious cardiac patients, recommended strategies include brief, early appointments, gentle sedation (oral anxiolytics or nitrous oxide), and effective communication to lessen fear. Such an approach stabilizes hemodynamics and lowers the risk of ischemic events. Encouraging patients to hyperventilate forcefully is counterproductive: it can induce respiratory alkalosis, resulting in dizziness, possible changes in coronary blood flow, and heightened anxiety. Instead, controlled deep breathing or other relaxation exercises are preferred to maintain calm. Thus, forced hyperventilation is not a standard stress-reduction tool.

117. (B) Hemophilia may require factor VIII replacement, while von Willebrand disease often responds to desmopressin

Hemophilia A (deficiency of factor VIII) patients often need factor VIII replacement therapy before invasive procedures to prevent severe bleeding. In contrast, many patients with von Willebrand disease (vWD) experience improved factor VIII stability and platelet adhesion with desmopressin (DDAVP), boosting endogenous von Willebrand factor release. While certain severe vWD subtypes may also require specific factor concentrates, mild forms can frequently be managed with DDAVP. General anesthesia is not automatically mandated for mild hemophilia if adequate factor replacement and local hemostatic measures (e.g., sutures, fibrin sealants) are employed. Thus, therapeutic approaches differ between these clotting disorders.

118. (B) Oral infections or diseased teeth can exacerbate systemic infection risk during immunosuppression

Patients undergoing chemotherapy often experience severe immunosuppression, raising vulnerability to opportunistic infections. Pre-existing oral issues—like periodontal disease, caries, or abscesses—become potential portals of bacterial or fungal invasion, which can rapidly disseminate under reduced immunity. A thorough dental evaluation and necessary prophylactic care (e.g., extractions of hopeless teeth, periodontal scaling) minimize subsequent infection risks. Chemotherapy does not cure dental pathologies; it can worsen them by reducing salivary flow and impairing mucosal integrity. Hence, addressing dental concerns prior to oncology treatment is critical for preventing complications and preserving overall systemic health.

119. (C) Topical thrombin, sutures, and possibly a platelet transfusion if severe

Patients with significant thrombocytopenia (platelet count below 50,000/μL) are at elevated risk of hemorrhage during and after dental extractions. Local hemostatic aids like topical thrombin, oxidized cellulose, or collagen plugs bolster clot formation, while resorbable sutures help stabilize the wound. If the platelet level is dangerously low (e.g., <20,000/μL) or active bleeding risk is

very high, platelet transfusions may be required, coordinated with the patient's hematologist. Intravenous immunoglobulins are reserved for specific immune thrombocytopenic scenarios, not typically used as a local measure. Canceling the extraction is unwarranted if carefully managed within a controlled, supportive setting.

120. (A) Electric toothbrush, stabilized handle, and short recall visits

Parkinson's disease patients frequently experience tremors and motor coordination deficits, complicating oral hygiene tasks. An electric toothbrush with a stable, enlarged grip can compensate for limited dexterity, promoting more effective plaque control. Regular short-interval recall visits allow professional cleaning and early interception of problems. Full dentures are not always indicated unless teeth are beyond salvage, and they may also challenge a patient's coordination. High-flow oxygen or restricting mouth opening does not address the primary issue of compromised motor skills. A supportive, adaptive approach fosters better oral health outcomes in Parkinson's disease.

121. (B) Request lab updates (INR, platelet count) and minimize invasive procedures if INR >3.5

Patients with cirrhosis can exhibit impaired clotting factor synthesis, leading to elevated INR and decreased platelet production. Before interventions with bleeding risks, updated laboratory values (INR, platelet count) guide necessary precautions. If INR exceeds 3.5, invasive procedures may be deferred or modified (fewer procedures per visit, local hemostatic agents, or hematology consult). Full mouth extractions based solely on cirrhosis are neither standard nor justified unless teeth are unsalvageable. Doubling local anesthetic is unwarranted and potentially harmful. Hence, verifying current coagulation status helps tailor treatment, ensuring patient safety while addressing essential restorative needs.

122. (B) Reinforce salivary substitutes and short chair time

SLE patients may experience secondary Sjögren's syndrome or salivary gland hypofunction, causing xerostomia that complicates restorative procedures and increases caries risk. Advising salivary substitutes reduces dryness, boosting comfort and bonding success during crown placement. Additionally, short, well-paced appointments ease physical stress, particularly if joint issues flare. Low-dose steroid therapy rarely requires prophylactic antibiotics unless other comorbidities exist, nor is halting steroids advised without rheumatologic input. General anesthesia is unnecessary for stable SLE patients needing routine restorative care. Hence, supporting salivary flow and minimizing procedural stress remain key considerations.

123. (B) Hairy leukoplakia on the lateral tongue border

Oral hairy leukoplakia, primarily caused by Epstein-Barr virus (EBV), emerges as corrugated, white lesions along the lateral tongue in immunocompromised patients, particularly in advanced HIV disease. Its appearance often signals a marked reduction in CD4 count and heightened susceptibility to opportunistic infections. Plaque-induced gingivitis and mild aphthous ulcers can occur in the general population and are not necessarily indicative of severe immunosuppression. Calculus accumulation stems from local oral hygiene factors rather than immune compromise. Consequently, hairy leukoplakia is a red flag for significant immunodeficiency and warrants closer investigation of systemic HIV status.

124. (C) Sick sinus syndrome or arrhythmic condition

Faintness or near-syncope in the dental chair can arise from bradyarrhythmias, especially if a patient exhibits slow or irregular pulses. Even though the patient is hypertensive, they could simultaneously have an underlying conduction abnormality like sick sinus syndrome. This condition features impaired sinus node function, manifesting as bradycardia, sinus pauses, or alternating slow-fast arrhythmias. Mitral valve prolapse usually doesn't cause persistent slow heart rates. Myxedema coma and essential thrombocythemia are unrelated to the identified bradyarrhythmia. Identifying an arrhythmic basis is vital, prompting referral to a cardiologist for further evaluation and ensuring safer management strategies during dental care.

125. (B) Anaphylaxis typically includes urticaria, airway edema, and severe respiratory distress

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When administering local anesthetics, patients may experience vasovagal syncope or, less commonly, anaphylactic reactions. Vasovagal syncope is a reflex-mediated drop in heart rate and blood pressure, leading to lightheadedness or fainting that rapidly improves when supine. It lacks the hallmark features of an allergy, such as skin rashes, itching, or airway involvement. Anaphylaxis often presents with generalized urticaria, marked respiratory difficulty (due to laryngeal edema or bronchospasm), and precipitous hypotension requiring urgent intervention. Hence, the presence of cutaneous and airway symptoms differentiates anaphylaxis from a simple vasovagal episode induced by anxiety or pain.

126. (C) Using repeated simple commands and dividing treatment into short visits

Patients with mild Alzheimer's disease struggle with short-term memory deficits and can become overwhelmed by lengthy or complex instructions. Simplifying communication into clear, stepwise directions fosters understanding and cooperation. Additionally, shorter appointments help minimize fatigue and confusion. Long, continuous procedures may exhaust cognitive resources, reducing compliance. Although educational videos may be useful for some patients, individuals with Alzheimer's may not retain that information effectively. Tailoring the dental environment—such as minimizing distractions and offering reassurance—also supports a successful outcome. Repetitive, concise communication is key to meeting the needs of cognitively impaired patients.

127. (B) Ensure she consumes a carbohydrate source or sweet drink before starting

Skipping breakfast can predispose brittle Type 1 diabetics to acute hypoglycemia, especially under the stress of dental procedures. Ensuring the patient has an adequate carbohydrate intake is critical to sustain safe glucose levels. If the patient cannot eat solid food, a sweet beverage or glucose gel helps maintain baseline glycemia. Administering more insulin or epinephrine is inappropriate since both can alter blood glucose in an unpredictable manner, potentially leading to a crisis. Local anesthetic dosage changes do not address hypoglycemia risk. Maintaining safe glycemic control prevents intraoperative emergencies and supports patient well-being.

128. (C) Invasive procedures like dental implants or extractions

Patients on bisphosphonates—especially IV or long-term oral therapy—face elevated risk of bisphosphonate-related osteonecrosis of the jaw (BRONJ), particularly after invasive treatments that affect bone, such as extractions or implant placements. Even minor alveolar trauma can precipitate non-healing lesions in compromised bone. Routine fillings, prophylaxis, or orthodontic interventions generally pose lower risk, although caution remains warranted. Nonetheless, procedures creating direct bone exposure demand thorough risk-benefit discussion, verifying drug history (including duration and route). If possible, completing invasive treatments before initiating bisphosphonates is ideal. Hence, obtaining careful informed consent for higher-risk interventions is essential.

129. (B) Supplemental oxygen stabilizes or increases oxygen delivery to ischemic cardiac tissue

In patients prone to angina, ensuring adequate oxygenation can help prevent myocardial ischemia, particularly under stressful conditions like a long dental procedure. Administering a low-to-moderate flow of supplemental oxygen (e.g., 2–3 L/min) improves the oxygen content of inhaled air, potentially aiding coronary perfusion. Continuous, high-flow oxygen for all patients is unnecessary and could mask respiratory drive in certain conditions (e.g., COPD). However, targeted oxygen supplementation can boost myocardial oxygen supply, reducing the likelihood or severity of ischemic chest pain. This approach works alongside other stress reduction measures.

130. (D) Scheduling multiple lengthy procedures under heavy sedation

Pregnant patients, especially in the late third trimester, often experience discomfort lying flat due to compression of the inferior vena cava, so a slight left tilt prevents supine hypotensive syndrome. Shorter appointments minimize stress and help avoid fatigue. Local anesthetics with minimal epinephrine are typically acceptable to

ensure adequate pain control and reduced systemic absorption. However, prolonged, heavily sedated sessions pose risks of respiratory compromise, hypotension, and decreased fetal oxygenation. Thus, dividing treatments into manageable appointments is safer, aligning with the best-practice approach for maternal and fetal well-being.

131. (C) Postponing all minor treatments until absolute immunity is normal

Medically compromised or immunosuppressed patients often cannot wait for "normal" immune function, as some conditions (e.g., HIV) may never fully normalize. Minor treatments can be performed with precautions—such as short appointments, prophylactic antibiotics if neutropenia is severe, or special protective measures—to minimize infection risk. Strict adherence to universal precautions (sterile instruments, barrier protection) is imperative. Consulting with a physician regarding immunosuppressant or antiretroviral medication interactions is equally critical for safe dental management. Deferring all dental care indefinitely could exacerbate oral diseases, leading to more severe complications. Thus, total postponement until complete immune restoration is generally not required.

132. (A) Emergency care addresses acute pain/infection that cannot be delayed, while elective care can be postponed until optimal health status

Emergency dental interventions—such as managing severe pain, draining abscesses, or removing sources of life-threatening infection—cannot be safely delayed, even in patients with complex medical conditions. By contrast, elective procedures (e.g., cosmetic treatments, routine restorations) might be rescheduled to a time when systemic factors are better controlled or the patient's physician adjusts relevant medications. Differentiating these categories helps prioritize care to mitigate immediate risks while deferring less urgent work until it's medically safer. Consequently, ensuring stable medical status and minimizing complications is critical before initiating purely elective treatments in compromised patients.

133. (B) Adequate pain management, hydration, and possibly short sedation

During a sickle cell crisis, hypoxia, dehydration, and stress can worsen vaso-occlusive episodes. Addressing severe dental pain is paramount, but in a controlled manner. Ensuring adequate hydration and appropriate analgesics supports oxygen delivery and eases overall suffering. Mild sedation or stress-reduction techniques may help if a procedure is urgent. However, complex or lengthy surgical interventions are better deferred until the patient stabilizes. Strenuous exercise exacerbates crisis risk by elevating metabolic demand. Local anesthesia alone does not guarantee crisis prevention. Thus, focusing on pain relief, hydration, and cautious sedation ensures safer, more comfortable management.

134. (A) Increase oxygen flow and re-position upright

Patients with severe COPD often struggle to breathe when supine, compromising diaphragmatic expansion. Here, the oxygen saturation dropping from 94% to 88% reflects a significant decrease in pulmonary function, possibly exacerbated by a fully reclined position. Immediately returning the patient to a more upright posture improves airway patency and lung volume. Slightly increasing oxygen flow—while monitoring for signs of CO2 retention—helps reestablish safer oxygen levels. Continuing the procedure without addressing respiratory compromise is unsafe. Discontinuing oxygen or giving nitroglycerin is not indicated unless cardiac ischemia is suspected. Restoring adequate ventilation is paramount in COPD management.

135. (A) Perform extractions in multiple segments using local hemostatic aids

Dual antiplatelet therapy significantly lowers thrombotic risk in ischemic heart disease patients but heightens bleeding potential during dental surgery. Stopping the medication may jeopardize cardiac stent patency or precipitate vascular events. Therefore, a safer approach involves staged extractions—focusing on a few teeth at a time—coupled with local hemostatic measures (e.g., hemostatic dressings, sutures, topical agents). This strategy helps control bleeding while retaining crucial antiplatelet therapy. Full-mouth removal in one session can overwhelm clotting capacity, especially under dual therapy. Simple practice enhancements like thorough suturing

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and post-operative instructions further minimize complications.

136. (B) Tachycardia, tremors, and heat intolerance

Hyperthyroidism can manifest with heightened sympathetic-like symptoms: elevated heart rate (tachycardia), tremors, and sensitivity to heat. These signs often herald thyroid hormone excess and may signal poorly controlled disease. Elective or stressful dental procedures under such conditions carry risks for thyroid storm—a life-threatening crisis. Bradycardia, hoarseness, or pallor align more with hypothyroidism, while swelling of the mouth floor suggests salivary pathology rather than thyroid dysfunction. Spotting hyperthyroid indicators ensures prompt endocrinologic consultation and stabilization before major interventions, lowering potential medical complications during or after dental treatment.

137. (B) Leukemia or a platelet disorder

Unexplained gingival bleeding, easy bruising, and fatigue can indicate hematological abnormalities, such as leukemia (where abnormal white cells crowd out normal hematopoiesis) or platelet-related disorders (thrombocytopenia or platelet dysfunction). Peptic ulcer disease typically presents with gastrointestinal discomfort or bleeding, not primarily oral hematologic signs. Migraine and allergic rhinitis don't commonly produce gum bleeding or bruising. Recognizing these hematological warning signs triggers immediate referral for blood tests (CBC, peripheral smear, etc.) to rule out malignancy or coagulopathies, crucial for early diagnosis and patient safety in a dental context.

138. (B) Use lead apron and thyroid collar, minimize exposure, proceed if necessary

Although pregnancy calls for heightened caution with ionizing radiation, genuine dental emergencies sometimes demand diagnostic imaging. Current guidelines endorse using lead aprons, thyroid collars, and the "as low as reasonably achievable" principle. Careful positioning and restricting the beam reduce scatter and fetal exposure. Postponing all radiographs could cause delays in diagnosing serious issues, endangering maternal health. Conversely, full-body shielding plus high exposures is counterproductive, and obtaining multiple imaging series simultaneously is unwarranted unless clinically justified. A single targeted x-ray, with appropriate protection, remains acceptable and safe when required to manage an urgent dental problem.

139. (A) Provide sedation in a hospital setting, coordinate with neurology, and perform phased treatments

In patients with poorly controlled epilepsy, abrupt drug cessation can trigger status epilepticus, a dangerous complication. Prolonged dental sessions intensify patient stress, increasing seizure likelihood, and partial care (e.g., scaling alone) fails to address fractured teeth and periodontal destruction comprehensively. Instead, hospital-based sedation or general anesthesia ensures a controlled environment equipped for medical emergencies, simultaneously enabling extensive or phased treatments with minimized seizure risk. Consulting the neurologist is essential for optimal medication management (possibly adjusting phenytoin or adding supplementary agents). This multidisciplinary approach enhances safety, addresses dental pathology thoroughly, and minimizes exacerbation of seizure activity.

140. (B) Compliance with glycemic control

Recurrent periodontal abscesses, slow wound healing, and opportunistic infections such as candidiasis strongly suggest that a patient's diabetes might be poorly controlled. Elevated blood glucose levels impair neutrophil function, microcirculation, and overall immune response, fostering bacterial and fungal proliferation. Hyperthyroidism is not typically associated with frequent abscesses, and allergies or calcium deficiencies seldom produce this clinical picture. Verifying the patient's glycemic control—via hemoglobin A1c or regular glucose checks—and emphasizing adherence to diabetic treatment regimens is crucial to improving oral health outcomes in diabetic individuals.

141. (C) They reduce the immune system's capacity to contain microbial proliferation

Post-transplant immunosuppressive therapy downregulates the host's immune responses to prevent organ rejection. However, this dampening of T-cell function and other immune mechanisms also

diminishes the body's ability to control bacterial, viral, and fungal pathogens in the orofacial region. Common oral flora can thus become invasive under these conditions, leading to rapid spread of infection and severe presentations. Salivary defenses do not necessarily increase; rather, the overall protective system weakens. Consequently, immunosuppressed patients can develop orofacial infections that progress quickly and require prompt, aggressive treatment to avert systemic complications.

142. (A) Both Assertion and Reason are true, and Reason is the correct explanation

Poorly controlled diabetes induces microvascular changes (thickened basement membranes, reduced perfusion) and impairs leukocyte function. These factors promote tissue inflammation, hamper wound healing, and facilitate periodontal destruction. Elevated blood sugar fosters a microbial environment favoring periodontal pathogens. Consequently, diabetic patients with chronic hyperglycemia often experience pronounced periodontal disease, affirming the assertion. The compromised vascular and immunological systems adequately explain this heightened susceptibility, confirming the reason as the direct causal factor. Hence, addressing the root cause—optimal glycemic regulation—forms a cornerstone of effective periodontal management in uncontrolled diabetics, validating both the assertion and its rationale.

143. (B) Antibiotic prophylaxis tailored to neutrophil count and infection risk

Severely immunocompromised HIV-positive patients (CD4 <200 cells/μL) face a high risk of bacterial superinfections following invasive dental procedures. Evaluating their absolute neutrophil count, overall infection risk, and medical stability helps determine the need for prophylactic antibiotics. Additionally, prophylactic antifungal therapy may be considered if candidiasis risk is high, but universal antifungal rinses aren't mandatory in all cases. Fasting does not mitigate infection risk. Local anesthesia remains safe and vital for pain control. Thus, an individualized antibiotic regimen, based on lab values and clinical assessment, commonly prevents postoperative opportunistic infections.

144. (D) Halting all prophylaxis if the patient already had it last year

High-risk patients—those with previous infective endocarditis or certain congenital heart anomalies—require prophylaxis for procedures likely to cause significant bacteremia. Recommended measures include maintaining excellent oral hygiene, using pre-procedure antimicrobial rinses to reduce bacterial load, and administering a single-dose antibiotic (often amoxicillin) about an hour prior to the appointment. Prophylaxis is indicated each time a new invasive dental procedure is performed, regardless of a prior prophylactic event months or years ago. Temporarily ceasing prophylaxis solely due to a previous year's usage leaves patients at renewed risk for endocarditis.

145. (B) Light conscious sedation with careful respiratory monitoring is preferred in COPD

Severe COPD often limits pulmonary reserve, rendering these patients more susceptible to hypoventilation and hypercapnia under deeper sedation. Consequently, mild-to-moderate sedation—often short-acting benzodiazepines or nitrous oxide at low concentrations—helps control anxiety without severely compromising respiration. Vigilant monitoring of oxygen saturation and end-tidal CO2 is imperative. Those with normal lung function can usually tolerate deeper sedation if needed. Declaring sedation unnecessary in COPD or using high-dose sedatives may precipitate respiratory depression or acute exacerbations. Tailoring sedation level to individual respiratory capacity ensures both patient comfort and safety in compromised individuals.

146. (B) Stop treatment, provide sublingual nitroglycerin, and reassure

Even mild chest discomfort in a patient with known angina mandates cautious action. Halting the procedure prevents additional stress that might precipitate worsening ischemia. Sublingual nitroglycerin can dilate coronary arteries, alleviating anginal pain, while gentle reassurance helps lower sympathetic drive. Monitoring vitals and ECG remains critical. High-flow oxygen (12 L/min) is typically reserved for severe desaturation or acute distress; routine high-flow may not be essential if the patient's oxygen saturation is stable. Atropine elevates heart rate, used primarily for bradycardia,

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not angina. Hence, nitroglycerin and psychological support constitute the most appropriate immediate response.

147. (B) Proceed with drainage under antibiotic cover, possibly in a hospital setting

With neutropenia (low WBCs), infections can escalate rapidly and become life-threatening, so addressing a dental abscess is urgent. Refusing treatment until chemotherapy concludes may allow the infection to worsen, endangering overall health. Drainage (with local anesthesia) is paramount, coupled with antibiotic therapy to contain the spread of infection. Treatment in a controlled hospital environment offers immediate medical support if complications like sepsis arise. A root canal might be an adjunct, but ignoring sedation and antibiotic cover poses undue risk. Merely applying topical gel fails to manage the deeper infection or ensure appropriate analgesia.

148. (A) Both Assertion and Reason are true, and Reason correctly explains the Assertion

Individuals with chronic kidney disease cannot adequately clear substances that rely on renal pathways for excretion. As a result, standard drug dosages can accumulate, producing enhanced toxicity or prolonged half-lives. This phenomenon underpins the need for dose modifications or alternative drug choices. Because the kidney is indeed the primary organ for excreting many medications, the logic is straightforward: compromised renal function directly alters these pharmacokinetics. Therefore, both the assertion and the reason are correct, and the latter accurately elucidates why patients in chronic renal failure experience altered medication metabolism and excretion.

149. (B) Certain supplements can increase bleeding risk or interact with prescription drugs

Herbal supplements (e.g., Ginkgo biloba, garlic, ginseng) can exert notable physiological effects, such as antiplatelet activity or interactions with cytochrome P450 enzymes. Consequently, these agents may amplify bleeding risk or alter metabolism of concurrently administered drugs like anticoagulants or antihypertensives. Even though some patients assume herbal products are benign, they can profoundly affect perioperative and dental outcomes. Hence, thorough medication reviews must encompass over-the-counter and herbal agents to adjust treatment plans or consult with physicians if necessary. Failing to recognize these potential interactions could jeopardize patient safety in a dental setting.

150. (B) Proceed with sedation after verifying stable blood pressure and consulting the physician if needed

Safe sedation in hypertensive patients hinges on stable cardiovascular status and minimal risk of hypotension or hypertension spikes. Confirming the patient's usual blood pressure control and continuing antihypertensives (unless otherwise directed) help maintain equilibrium. Abruptly discontinuing medication may provoke rebound hypertension. Doubling sedation to "overpower" high blood pressure is ill-advised and can precipitate dangerous hemodynamic fluctuations. General anesthesia is not mandatory unless the procedure complexity or patient's condition warrants it. Consulting the patient's physician ensures synergy in medication management, optimizing sedation safety and reducing complications in those on multiple antihypertensives.

151. (B) Evaluating the likelihood of adverse events based on a patient's systemic condition and planning care accordingly

Risk assessment in the dental office involves systematically identifying factors—such as cardiovascular disease, diabetes, immunocompromised states, or bleeding disorders—that could increase the chances of complications during or after treatment. This process helps in crafting a tailored care plan: scheduling shorter, stress-minimized appointments; coordinating with the patient's physician for possible medication adjustments; and applying specialized measures (e.g., antibiotic prophylaxis, local hemostatic methods). Avoidance of all procedures or automatic referral to higher centers is rarely necessary if effective assessment and mitigation strategies are in place. Appropriate risk assessment thus supports safer, personalized dental management for compromised patients.

152. (A) Lidocaine 2% with 1:100,000 epinephrine, administered in cautious, limited doses

For patients with cardiovascular disease, a moderate epinephrine concentration (1:100,000) in lidocaine is commonly recommended to maintain sufficient anesthesia and hemostasis while limiting systemic adrenergic effects. This helps minimize the risk of tachycardia or elevated blood pressure. Bupivacaine without epinephrine may offer extended anesthesia but lacks vasoconstrictive control of bleeding. Articaine with higher-dose epinephrine (1:50,000) can be used selectively but necessitates caution because of increased potential for cardiovascular stimulation. Employing repeated increments of high-dose epinephrine is generally discouraged in compromised cardiac patients. A carefully delivered standard lidocaine-epinephrine combination remains the safer clinical standard.

153. (B) They can reduce renal blood flow and exacerbate kidney injury

Nonsteroidal anti-inflammatory drugs inhibit prostaglandin synthesis, including those that help maintain adequate renal perfusion. In patients with CKD, diminished prostaglandin-mediated blood flow can worsen glomerular filtration or promote acute-on-chronic kidney injury. Although NSAIDs are effective analgesics, their nephrotoxic potential underscores caution. Patients with CKD often rely on adequate renal blood flow supported by prostaglandins, so blocking these pathways risks further deterioration of renal function. Adjusting or avoiding NSAIDs in favor of alternate analgesics (e.g., acetaminophen or opioids under guidance) helps protect kidney health in compromised individuals.

154. (C) Abruptly starting major procedures without discussion

Effective stress reduction enhances safety for medically compromised patients by preventing surges in blood pressure, heart rate, or respiratory distress. Common strategies include explaining each step of the procedure, using short visits, engaging supportive caregivers, and, if needed, offering sedation or analgesia to diminish anxiety. Thorough communication helps patients anticipate what to expect, alleviating fears. Conversely, initiating invasive procedures without prior discussion can cause panic, potential vasovagal reactions, or exacerbation of underlying systemic conditions. Hence, abrupt interventions without patient preparation run counter to recommended stress management protocols in medically complex care.

155. (A) In stable asthma, elective treatment can proceed with an inhaler at hand; in acute asthma, urgent interventions might need hospital-based care

Stable asthmatic patients, whose symptoms are well-controlled, typically tolerate routine dental treatments with minimal modifications, ensuring that a short-acting bronchodilator (e.g., salbutamol) is available and the environment is stress-free. Conversely, someone experiencing frequent acute episodes—or currently in an exacerbation—faces significant respiratory compromise, raising the risk of bronchospasm during procedures. In such acute or poorly controlled cases, deferring elective dental work or conducting treatment in a hospital setting may be necessary. Antibiotics are not automatically indicated for asthma unless specific infection is identified. Thus, management differs substantially depending on disease stability.

156. (B) Use minimal adrenaline doses to prevent hypertension and bradycardia

Non-selective beta-blockers inhibit β-adrenergic receptors, leaving alpha-adrenergic effects unopposed if epinephrine is introduced systemically in larger amounts. This scenario can precipitate a hypertensive crisis coupled with reflex bradycardia. Thus, moderate use of vasoconstrictors—delivered slowly and in limited doses—helps achieve hemostasis and adequate anesthesia while minimizing cardiovascular stress. Complete avoidance of vasoconstrictors might result in less effective anesthesia or more bleeding, while maximal doses of epinephrine risk dangerous hemodynamic fluctuations. Isoproterenol co-administration is not standard practice, as it can worsen tachyarrhythmias. Therefore, conservative epinephrine use is safest with non-selective beta-blockade.

157. (B) Use local hemostatic agents like collagen plugs, and carefully suture

Dabigatran is a direct thrombin inhibitor that significantly reduces clot stability. Abrupt cessation

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could elevate stroke or thrombotic risks in indicated conditions (e.g., atrial fibrillation). When the physician advises continuing therapy, local measures become essential to prevent prolonged bleeding post-extraction. Collagen plugs or gelatin sponges enhance clot formation, while suturing helps secure the site. Scheduling multiple extractions in one session might magnify bleeding risks if the sites are numerous. Pulpotomy instead of extraction may not address the underlying pathology fully. Increasing dabigatran is contraindicated, as it would heighten bleeding potential.

158. (A) Avoid vasoconstrictors entirely, consider sedation to minimize stress

Uncontrolled hyperthyroid patients carry a heightened risk of arrhythmias, hypertension, and thyrotoxic crisis if they become overly stressed or exposed to excessive sympathomimetic agents (like epinephrine). Minimizing or avoiding vasoconstrictors helps limit cardiovascular stimulation. Mild sedation (oral or nitrous oxide) lowers anxiety and associated catecholamine release. Urgent treatment can still proceed but with short, controlled appointments and close vitals monitoring. Encouraging brisk exercise might further elevate metabolic rate. Thyroid hormone supplementation would be counterproductive. Full-mouth rehabilitation during a hyperthyroid state is risky; palliative or limited procedures are safer until stable.

159. (A) Request liver function tests and complete blood count

Methotrexate can affect hematopoiesis, potentially reducing white cells or platelets, and can also impact liver function over time. Before any invasive dental procedure that risks bleeding or infection, verifying a recent complete blood count helps detect cytopenias, and checking liver function tests can reveal significant hepatotoxicity. Abruptly ceasing methotrexate often triggers rheumatoid flare-ups and is undertaken only with rheumatology input. The type of local anesthetic is usually not restricted solely by methotrexate use, and organ transplant evaluation is unrelated here. Ensuring normal blood parameters supports safer outcomes in invasive dental work.

160. (D) Advising the patient to stop all antihypertensives before the appointment

Stroke survivors often require stable blood pressure management to prevent recurrent events. Abrupt cessation of antihypertensives can provoke a hypertensive crisis or hamper cerebral perfusion, complicating both the patient's general health and any dental procedure. Instead, recommended measures include short, low-stress appointments, maintaining normal or slightly higher side-of-normal BP, and applying sedation or anxiolysis to reduce stress-induced surges. Monitoring blood pressure ensures early detection of problematic fluctuations. Instructing patients to discontinue routine medications without medical guidance is risky and contradicts prudent management of post-stroke individuals.

161. (C) Rheumatic heart disease without valvular dysfunction

Prophylactic antibiotics before certain dental procedures are recommended for high-risk cardiac conditions, including a history of infective endocarditis, prosthetic heart valves, or specific congenital anomalies. A heart transplant patient with valvulopathy also fits the category. However, isolated rheumatic heart disease without residual valvular abnormalities is generally considered moderate or low risk per updated guidelines; prophylaxis is usually not indicated unless coexisting valvular dysfunction or a prior endocarditis episode is documented. Emphasizing targeted prophylaxis helps prevent antibiotic overuse and resistance while still protecting those with the greatest susceptibility to infective endocarditis.

162. (B) Hypoglycemia demands rapid glucose administration; vasovagal faint often recovers with supine positioning and ammonia inhalants

When a known diabetic patient exhibits hypoglycemic signs—tremors, sweating, confusion, possible faintness—prompt administration of oral glucose (if conscious) or a glucagon injection (if unconscious) stabilizes blood sugar. In contrast, a simple vasovagal syncope typically improves by laying the patient flat, elevating the legs to restore cerebral perfusion, and possibly using ammonia inhalants if mild stimulation is necessary. Oxygen supplementation may help, but the root cause is reduced blood flow to the brain, not low glucose.

Epinephrine injection is for anaphylaxis, not fainting or hypoglycemia. Hence, the immediate interventions differ significantly between these two scenarios.

163. (A) Seating the patient upright, using rubber dam isolation and suction

Neuromuscular disorders or stroke survivors may have reduced swallowing reflexes, risking aspiration of fluids or debris. Positioning the patient in an upright or semi-upright posture aids gravity in clearing the oropharynx, while robust suction and a rubber dam limit fluid accumulation. Encouraging a substantial meal right before treatment increases the chance of regurgitation. For many patients, routine outpatient care remains feasible if protective measures are in place; mandatory overnight admissions are unwarranted unless complexities demand intensive monitoring. Thus, strategic positioning and good isolation techniques are pivotal in averting aspiration pneumonia.

164. (A) Use bite blocks or rest periods, scheduling shorter appointments

Parkinson's patients typically have oromotor dysfunction, muscular rigidity, or tremors that complicate sustained mouth opening. Supporting their comfort requires employing bite blocks to reduce muscular strain and scheduling multiple brief appointments with rest intervals. This approach prevents fatigue and fosters better tolerance. Forcing the jaw open aggravates discomfort and possible injury. Local anesthesia is often still necessary to manage pain, and botulinum toxin injections for masseter spasm are more applicable to specific dystonia rather than routine Parkinson's management. Therefore, short sessions plus bite blocks represent the most pragmatic adjustment for these patients' needs.

165. (B) Confirm factor levels and coordinate Factor IX replacement therapy pre-procedure

Hemophilia B, caused by a deficiency in Factor IX, poses a serious risk of prolonged or uncontrollable bleeding if invasive dental procedures are performed without proper measures. Patients often need factor replacement to raise clotting factor levels to a safer range before treatments like extractions. While infiltration anesthesia can still cause tissue trauma, it doesn't preclude bleeding risk entirely. Consulting the patient's hematologist for factor replacement and any adjunct therapy (e.g., antifibrinolytic drugs) is mandatory. This targeted approach ensures adequate hemostasis, supplemented with local measures (such as sutures), improving patient safety and outcomes.

166. (C) Pause the procedure, assess blood pressure and heart rate, and check oxygen saturation

When a cardiovascular-compromised patient develops dizziness, it signals possible hypotension, arrhythmia, or early signs of reduced cerebral perfusion. Abruptly continuing might worsen the problem. Halting the procedure allows quick evaluation of vital signs—blood pressure, pulse, oxygen saturation—to pinpoint the cause. Oxygen may be administered if saturation is low, while an ECG or further assessment might be necessary if arrhythmia is suspected. Full supine positioning might be helpful in cases of hypotension, but first verifying vitals is essential. Administering atropine or rapidly completing the procedure without addressing underlying issues could lead to serious complications.

167. (D) Recommending mouth rinses containing high alcohol content to disinfect

Patients on chemotherapy often battle diminished salivary flow, leaving them prone to oral infections, mucosal trauma, and rampant caries. Hydration, sugar-free lozenges or gum to promote saliva, and topical fluorides are all valuable. Alcohol-based mouth rinses, however, can worsen dryness and irritate already fragile mucosa, leading to further discomfort. Instead, gentle, alcohol-free rinses (e.g., mild salt and baking soda solutions or specialized alcohol-free products) are preferable for cleansing. Hence, advising high-alcohol rinses is counterproductive, intensifying xerostomia and mucosal irritation in a patient whose oral tissues are already compromised by cytotoxic therapy.

168. (D) Hypersensitivity reaction to local anesthetics

Bisphosphonates—especially intravenous formulations used to treat metastatic bone lesions or severe osteoporosis—can predispose patients to osteonecrosis of the jaw. They also interfere with bone remodeling, possibly delaying or complicating

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the healing process after extractions. Alveolar osteitis (dry socket) incidence may be somewhat increased with impaired blood supply and local bone turnover. However, these issues are separate from local anesthetic hypersensitivity, which typically stems from allergic or toxic reactions to the anesthetic or preservative agents, not from bisphosphonate therapy. Hence, bisphosphonates do not intrinsically raise the likelihood of local anesthetic allergic events.

169. (C) Type 1 generally relies on insulin, risking acute hypoglycemia if meals are skipped; Type 2 can often control glucose via oral meds or diet

Type 1 diabetes results from pancreatic beta-cell destruction, necessitating exogenous insulin to regulate glucose. Insulin therapy raises the possibility of hypoglycemia if patients delay meals or have unexpected energy expenditures. Conversely, many Type 2 diabetics manage glucose with oral agents (like metformin) or lifestyle modifications, although some may also require insulin in advanced disease. Both types still risk hyperglycemia or acute fluctuations if not properly managed, but Type 1 has less endogenous capacity to adjust insulin levels. Advising universal fasting is inappropriate, as skipping meals can provoke dangerously low blood sugars, especially in Type 1 diabetes.

170. (B) Short, staged appointments in a semi-upright position, limiting stress and monitoring vitals

Class III heart failure patients experience marked limitation of physical activity and can develop dyspnea or fatigue with minimal exertion. Stressful, prolonged dental procedures in a fully supine position may exacerbate respiratory distress or precipitate cardiac decompensation. Instead, dividing the treatment into short segments, offering a semi-upright chair position, and carefully tracking vitals (including oxygen saturation) help safeguard hemodynamic stability. Stopping all cardiac medications or proceeding with general anesthesia in an outpatient clinic without specialist input can be hazardous. Coordinating with the patient's cardiologist ensures the safest approach tailored to their specific cardiac status.

171. (B) Reinforce plaque control, frequent cleanings, and consider gingivoplasty if severe

Cyclosporine can induce gingival overgrowth, aggravated by poor oral hygiene. In addition, the patient's immunosuppression and steroid therapy complicate tissue healing and infection risk. Abruptly discontinuing immunosuppressants risks transplant rejection. Instead, intense plaque control regimens—frequent professional cleanings and thorough at-home care—often reduce inflammation and decrease gingival enlargement. When overgrowth severely impedes function or aesthetics, gingivoplasty can selectively remove redundant tissue while maintaining adequate crown height. Prolonged antibiotics without clear infection is unwarranted, and full-mouth extraction is a last resort in extreme cases. Thus, conservative measures plus possible surgical reshaping typically suffice.

172. (B) Provide prompt systemic antibiotics, possible drainage, and consider "stress dose" steroids

When a patient on chronic steroids develops an acute orofacial infection like cellulitis, timely antibiotic therapy and surgical intervention (incision, drainage) are crucial to prevent the spread of infection, given their immunocompromised status. Steroid therapy should not be halted abruptly; instead, if the situation is stressful or requires invasive procedures, consultation with the patient's physician regarding "stress dose" steroids can avert adrenal insufficiency. Topical antibiotics alone are inadequate for deep or spreading infections, and relying on spontaneous resolution is dangerous in immunosuppression. Therefore, a coordinated approach ensures both infection control and adrenal support.

173. (B) Use a simple, clear explanation, and confirm understanding with a caregiver or legal representative when needed

In patients with cognitive impairments (e.g., early dementia), the capacity to consent may be preserved partially if they comprehend the nature and consequences of treatment. Dentists must explain procedures at an appropriate level, using plain language and visual aids if helpful. If comprehension is limited, involving a legally authorized representative ensures consent is ethically and legally valid. Automatically disregarding the patient's capacity or offering only complicated documentation can lead to

confusion or unintentional lack of consent. Thus, respectful communication that gauges and supports the patient's capacity—while involving family or appointed guardians—underscores patient autonomy and best practices.

174. (C) Forcibly placing a hard mouth prop between the teeth

When a patient experiences an epileptic seizure, the priority is to prevent injury and ensure they can breathe freely. Dentists should remove handpieces or loose instruments from the oral cavity if possible and cushion the head to avoid trauma. Turning the patient slightly to one side aids drainage of saliva or vomit. However, forcibly inserting a mouth prop or any rigid object between clenched jaws may injure teeth, gingiva, or the TMJ, and it risks fracturing the prop or obstructing the airway. Instead, simply protect the patient until the seizure subsides.

175. (D) Well-controlled sinus tachycardia at 90 bpm

Elective treatment is typically deferred when patients exhibit acute cardiac instability: recent myocardial infarction (often guidelines suggest waiting at least four to six weeks), unstable angina, or severely elevated blood pressure at a hypertensive crisis threshold. These situations heighten the risk of complications like arrhythmias or stroke. A heart rate of 90 bpm in sinus tachycardia—if stable—does not, by itself, indicate severe distress or underlying instability. It could reflect anxiety or mild exertion, not necessarily requiring rescheduling. Dentists can proceed, employing measures to minimize stress and closely monitoring vitals for safety.

176. (B) Angina typically responds to sublingual nitroglycerin, whereas panic often improves with reassurance and controlled breathing

Panic attacks frequently present with palpitations, sweating, dyspnea, or chest tightness but are not caused by myocardial ischemia. Simple measures like calm reassurance, guided breathing, or mild anxiolytics often alleviate symptoms. Chest discomfort from angina is due to reduced coronary blood flow and can improve when the patient takes sublingual nitroglycerin, which dilates coronary vessels. Hyperventilation, tingling in extremities, and intangible fear can appear in panic, but they do not typically define angina. When uncertain, evaluating vitals and ECG can assist in differentiating the two and guiding the correct intervention.

177. (B) Infiltration or periodontal ligament injections with added hemostatic measures

For hemophilia, infiltration or intraligamentary anesthesia is often safer than nerve blocks, which risk deep hemorrhage in fascial planes. Even minor bleeds can expand in the pterygomandibular or sublingual space following block anesthesia. Local infiltration confines potential bleeding to superficial tissues, more easily controlled with pressure or hemostatic agents (e.g., Tranexamic acid mouthwash or topical fibrin sealants). Total avoidance of anesthesia is impractical and inhumane. While bilateral blocks might simplify anesthesia, the potential for extensive bleeding complicates patient safety. Thus, infiltration or periodontal ligament injections combined with supportive hemostatic steps are recommended.

178. (B) Rinsing the mouth with water immediately after using the inhaler

Inhaled corticosteroids can predispose to oropharyngeal candidiasis by affecting local immunity and leaving steroid residues on mucosal surfaces. The recommended preventive measure is instructing patients to rinse thoroughly after each inhalation to wash away residual medication, significantly reducing fungal colonization. Stopping inhalers abruptly jeopardizes respiratory control. Antibiotics are ineffective against fungal overgrowth and might even worsen the oral microbiome imbalance. Fluid restriction is counterproductive for oral dryness. Adequate hydration, good oral hygiene, and post-inhalation rinsing help prevent thrush while allowing patients to continue essential inhaled steroid therapy safely.

179. (A) Transition the patient slowly from supine to upright, allowing time to stabilize

Orthostatic (postural) hypotension can result from blood pressure medications—particularly diuretics or alpha-blockers—and changes in body position. Patients may experience dizziness or even fainting if they stand too quickly. Gradual repositioning, pausing briefly in a semi-upright seat, and allowing the cardiovascular system to adapt can minimize abrupt drops in blood pressure. Encouraging them

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to hold their breath or stand abruptly can worsen symptoms. Intramuscular epinephrine is primarily for anaphylaxis or severe hypotensive crises, not routine orthostatic episodes. Slowly changing chair position, plus a moment for equilibrium, typically suffices for stable transitions.

180. (A) Administer oral glucose if conscious

Signs of acute confusion, sweating, and tachycardia in an insulin-dependent patient strongly suggest hypoglycemia. If the patient is still conscious, administering oral carbohydrates such as glucose gel or a sweetened drink quickly raises blood glucose and reverses symptoms. Failing to treat promptly may progress to seizures or unconsciousness. Proceeding with the procedure or simply placing a bite block ignores the urgency of restoring normal blood sugar. A transfusion would be irrelevant unless there was also a severe anemic or hemorrhagic issue, which is unlikely given the presentation. Stabilizing glucose is key to preventing further deterioration.

181. (A) Hospital-based setting for advanced respiratory support if needed

Severe or poorly controlled COPD can rapidly worsen under stressful conditions, including dental procedures. While short, low-stress appointments and supplemental oxygen are helpful, having a hospital setting or at least a facility equipped for advanced respiratory intervention may be prudent. Sudden desaturation or exacerbation of COPD could demand immediate respiratory therapy, bronchodilators, or noninvasive ventilation. High-dose IV sedation might depress respiration further, risking acute failure. Patients should continue prescribed medications, including bronchodilators and inhaled steroids. Antibiotics, if indicated for infection risk, are not automatically restricted. A hospital-based approach ensures both dental treatment and potential respiratory emergencies are managed safely.

182. (C) Consultation with a hepatologist to stabilize coagulopathy and plan prophylactic measures

Advanced cirrhosis compromises the liver's synthesis of clotting factors, elevating INR. Low platelets (often from hypersplenism) can further heighten bleeding risk. While endodontic re-treatment is less invasive than surgical extraction, unanticipated bleeding or infection can still occur. Coordinating with a hepatologist determines whether vitamin K, fresh frozen plasma, or platelet support is necessary to secure hemostasis for even minimally invasive procedures. Platelet transfusion for only mild thrombocytopenia might not be essential unless counts are dangerously low. Oral sedation addresses anxiety but not coagulopathy. Foregoing updated labs or specialist input risks complications in a patient with fragile hepatic function.

183. (C) Kaposi's sarcoma lesions on the palate

Kaposi's sarcoma—characterized by bluish-purple or red vascular lesions in the oral cavity—commonly signifies advanced HIV infection. It reflects reactivation of Human Herpesvirus-8 (HHV-8) under profound immunosuppression. This neoplasm is often a red flag requiring oncologic evaluation and potential systemic therapy adjustments. Large aphthous ulcers could also be seen in advanced disease but do not carry the same specificity for severe immune compromise as Kaposi's sarcoma. Linea alba is a benign mucosal feature, while mild plaque is not an indicator of immunological decline. Recognizing KS prompts immediate medical follow-up and possible intervention.

184. (C) Lymphoma of the salivary gland

Sjögren's syndrome, an autoimmune condition characterized by lymphocytic infiltration of exocrine glands, carries a substantially increased risk of extranodal marginal zone B-cell lymphoma (MALT lymphoma) in the salivary glands. Bilateral, persistent parotid swelling—especially with atypical presentations or changes in texture—raises suspicion for malignant transformation. Although benign tumors like pleomorphic adenoma or Warthin's tumor can occur in the parotid, these typically present as unilateral masses. Recurrent sialadenitis is also possible but tends to produce episodic pain, inflammation, or infection. Hence, chronic bilateral enlargement in Sjögren's frequently signals potential lymphomatous progression requiring biopsy.

185. (C) Nitrous oxide offers rapid onset and easy titration, while oral benzodiazepines have variable absorption and slower offset

Nitrous oxide sedation begins working quickly (within minutes) and can be adjusted in real-time to achieve or maintain desired sedation depth. Once discontinued, it is largely eliminated by the lungs, allowing a relatively fast recovery. Oral benzodiazepines, however, rely on gastrointestinal absorption, leading to variable onset times and sedation depth. Metabolic pathways—particularly hepatic—govern their elimination, potentially prolonging sedation, especially in patients with compromised liver function. While benzodiazepines are effective anxiolytics, they lack the precise, immediate titration advantage of nitrous oxide. Consequently, in many medically compromised patients, controlling sedation precisely with nitrous oxide can be safer and more predictable.

186. (B) Encourage improved glycemic control before lengthy, elective procedures, addressing any urgent pain or infection promptly

An HbA1c of 10.5% signifies significantly elevated average blood glucose over the past three months. Elective, prolonged dental treatments pose higher risks of infection, delayed healing, and potential intraoperative hypoglycemia if dosing and meals are not well coordinated. Hence, advising the patient to stabilize glycemic control (with an endocrinologist's guidance) can reduce complications. Urgent issues (severe pain or infection) must still be dealt with promptly, often with antibiotic support and well-planned anesthesia to prevent uncontrolled infection. Withholding insulin or foregoing anesthesia can create dangerous fluctuations or undue discomfort, compromising patient safety and satisfaction.

187. (A) Administer sublingual nitroglycerin and allow rest

In a known coronary artery disease patient complaining of chest pressure, a cautious approach is essential, even if vitals appear stable and the ECG is unremarkable. Sublingual nitroglycerin can alleviate potential ischemia by dilating coronary vessels. Pausing the procedure and reassuring the patient helps reduce stress-induced sympathetic load. IV epinephrine is indicated for anaphylaxis or severe hypotension, which is not the case here. Chest compressions are performed only if cardiac arrest occurs (e.g., absent pulse). Continuing invasive treatment without intervention risks escalating ischemia, so sublingual nitroglycerin plus rest is the safest immediate strategy.

188. (C) On a non-dialysis day, ideally the day after dialysis, consulting with the nephrologist

Dialysis patients often receive anticoagulant therapy during sessions, and scheduling procedures immediately before or after dialysis can lead to unsteady coagulation parameters. Bleeding risk may be elevated if performed right after, and metabolic status might not be optimal if right before. A non-dialysis day, generally one day post-dialysis, allows more stable clotting function and fluid/electrolyte balance, providing a safer window for dental interventions. Coordinating with the nephrologist ensures potential medication adjustments or prophylaxis if needed. Late-evening procedures offer no specific benefit if they coincide with heightened fatigue or unstable fluid status.

189. (C) Certain high-risk patients might need prophylaxis to prevent hematogenous seeding of the joint

Although current recommendations vary and have become more conservative, prophylactic antibiotics for prosthetic joint patients may be indicated in specific high-risk scenarios (e.g., immunocompromised status, history of joint infection, or poorly controlled diabetes). Bacteremia from dental procedures can seed prosthetic surfaces, potentially causing serious joint infections. However, universal prophylaxis for every prosthetic joint patient is no longer the routine standard. Instead, individualized risk assessment determines necessity. Antibiotics target bacterial infections, not viral agents. Recognizing the patient's overall medical status, prior joint infections, and systemic risk factors guides an appropriate prophylactic protocol.

190. (B) Checking if the patient had lunch

A thorough understanding of the patient's systemic condition often necessitates medical consultation, especially with concerns like uncontrolled hypertension, recent cardiac decompensation, or frequent angina episodes. Coordinating with the patient's physician ensures safe medication management and stabilization before dental interventions. Whether the patient has eaten

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recently is relevant to blood glucose management in diabetics or sedation protocols but does not usually demand a formal medical referral. Although verifying meals is part of routine dental screening, it is not a standard reason for involving a specialist. Thus, lunch status alone rarely requires formal medical consultation.

191. (A) Both Assertion and Reason are true, and Reason is the correct explanation

Advanced COPD patients often rely on a hypoxic drive (low oxygen) to stimulate breathing, because their central chemoreceptors become less responsive to CO2. While some clinicians worry about providing supplemental oxygen and diminishing this drive, carefully supervised low-flow oxygen during a stressful procedure can stabilize oxygenation, avoiding dangerous desaturations. Because these patients have a precarious respiratory status, sedation or stress can precipitate acute exacerbations. Hence, minimal but adequate O2 ensures safer outcomes. The rationale that COPD shifts the respiratory drive from CO2 to O2 sensitivity underlies cautious oxygen delivery—thus both assertion and reason align.

192. (B) Provide antibiotic prophylaxis as per guidelines for prosthetic valves

Patients with prosthetic heart valves remain at high risk for infective endocarditis if bacteremia is induced during invasive dental procedures, including deep scaling. The American Heart Association guidelines classify them under highest risk, necessitating prophylactic antibiotics (often amoxicillin, or clindamycin for penicillin-allergic individuals) one hour prior to the procedure. Omitting prophylaxis may risk life-threatening endocarditis. Avoiding recommended treatments like subgingival scaling compromises oral health and can further raise infection risk long term. While local anesthesia is helpful, it does not replace antibiotic coverage in high-risk CHD or prosthetic valve patients.

193. (A) Incision, drainage, local measures, and continue warfarin

For a submandibular abscess in a warfarin-treated patient, an INR of 2.8 typically remains within a therapeutic range that is not excessively high. Proceeding with incision and drainage under local anesthesia is usually feasible if combined with careful local hemostatic measures like pressure application, suturing if needed, or gelatin sponges to minimize bleeding. Abrupt warfarin cessation could cause thromboembolic risks, and deferring urgent treatment allows infection to worsen. If needed, imaging (like ultrasound or CT) can be done promptly, not postponed for weeks. Timely drainage is crucial for infection control and preventing complications.

194. (B) Coordinate with gastroenterologist for possible platelet support, then carefully extract under local hemostatic measures

Severe liver disease can compromise both coagulation factor production and platelet count. This patient's history of esophageal varices and easy bruising indicates significant portal hypertension and a fragile hemostatic profile. Although an extraction is likely indicated, ignoring potential hemorrhagic complications could be perilous. Collaborating with his gastroenterologist or hepatologist helps determine whether platelet transfusion, vitamin K, or other supportive measures are needed pre-procedure. Local hemostatic agents (e.g., fibrin sealants, surgicel, or suturing) further mitigate bleeding risks. Attempting a restorative fix on a grossly decayed, fistulated tooth is typically futile. A drastic mandibulectomy is unwarranted.

195. (A) Reinforce oral hygiene, manage ulcers conservatively, and ensure normal blood counts before invasive therapy

Methotrexate can suppress bone marrow and damage mucosal surfaces, prompting recurrent oral ulcers and increasing infection risk from periodontitis. Bolstering oral hygiene helps reduce bacterial load, while topical agents (e.g., mouthrinses, protective gels) aid ulcer healing. Checking complete blood counts ensures the patient is not neutropenic or thrombocytopenic prior to deep scaling or surgery. Abruptly discontinuing methotrexate might trigger psoriatic arthritis flares and should only be done in consultation with the rheumatologist. Regional block anesthesia is not contraindicated, but staging and local measures minimize bleeding or infection. Overall, a cautious, supportive approach is key.

196. (C) Worsening glycemic control or possible hyperglycemia

Sudden escalation in oral candidiasis frequency, accompanied by increased periodontal issues, often signals poorly managed or deteriorating blood glucose levels in diabetic patients. Hyperglycemia fosters an environment conducive to opportunistic fungal growth and impairs immune responses, aggravating periodontal breakdown. Adrenal, thyroid, or parathyroid pathologies typically manifest with alternate clinical cues rather than recurring fungal episodes and advanced periodontitis. Identifying suboptimal glycemic control allows clinicians to coordinate with the patient's physician for medication or dietary adjustments. Restoring stable glucose helps curb fungal proliferation and protect against rapid periodontal decline.

197. (B) Plasma cortisol levels and ACTH stimulation test

Addison's disease arises from adrenal cortical insufficiency, leading to reduced cortisol (and often aldosterone) production. Clinical hallmarks include fatigue, low blood pressure, and characteristic hyperpigmentation of skin or mucosa resulting from elevated ACTH. Measuring morning plasma cortisol and evaluating cortisol response following synthetic ACTH administration confirm adrenal reserve. A suboptimal rise in cortisol indicates Addison's disease. Fasting glucose alone is not definitive, thyroid function tests evaluate different endocrinopathies, and hemoglobin electrophoresis identifies hemoglobin variants (e.g., in sickle cell disease). Thus, cortisol assays and the ACTH stimulation test are essential to diagnosing Addison's disease.

198. (A) Celiac leads predominantly to recurrent aphthous ulcers; Crohn's presents with cobblestone mucosa and deep fissures

Celiac disease, an autoimmune response to gluten, often manifests with malabsorption and nutrient deficiencies, producing recurrent aphthous-like ulcers in the mouth. On the other hand, Crohn's disease can involve the entire gastrointestinal tract, including orofacial regions, leading to granulomatous changes such as "cobblestone" mucosa, deep linear ulcerations, and lip swelling. Crohn's frequently presents with distinct oral manifestations, whereas celiac's hallmark remains malabsorption-related oral ulcers and enamel defects. Although celiac sometimes lacks overt oral signs, it can indeed produce recurrent sores. Hence, contrasting the ulcerative patterns underscores the differences in these two GI disorders.

199. (A) Provide thorough written and verbal instructions to a responsible caregiver

Alzheimer's disease compromises memory retention and comprehension, making it difficult for patients to consistently follow complex home-care instructions. Having a family member or caregiver receive both written and spoken guidance significantly improves adherence, especially if the instructions are concise and user-friendly. Telephonic instruction with jargon often proves ineffective if the patient's cognitive deficits impede recall. Hospitalization for routine procedures is generally unnecessary unless there are additional complicating factors. Completely omitting instructions jeopardizes postoperative care. A supportive caregiver can ensure medication schedules, dietary modifications, or wound care guidelines are followed, promoting safer recovery.

200. (B) Provide preoperative sublingual nitroglycerin if indicated, schedule a short morning appointment, and allow rest periods

In patients with angina, controlling procedural stress is crucial to avert myocardial ischemia. Administering sublingual nitroglycerin prophylactically (per physician advice) can preempt chest pain by dilating coronary arteries. Morning appointments optimize scheduling around the patient's circadian rhythm, often aligning with relatively lower blood pressure and stress. Incorporating rest breaks avoids prolonged sympathetic drive, as extended continuous procedures elevate heart rate and blood pressure. Keeping the patient supine for three hours can compromise breathing and exacerbate hemodynamic strain, while administering high-dose epinephrine infiltration might cause tachycardia and blood pressure spikes. Hence, short, well-managed sessions best preserve cardiac stability.

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CHAPTER 11

ORAL RADIOLOGY

1. (C) The removal or addition of electrons from an atom or molecule

   Ionization refers to the process by which atoms or molecules gain or lose electrons, resulting in a net charge. This typically occurs when radiation with sufficient energy interacts with matter, knocking out orbital electrons. Choices involving neutron changes (B) or photon generation without electron displacement (A) do not accurately describe ionization. Purely elastic collisions (D) do not necessarily lead to ion pair formation. Ionization is crucial to understand how radiation damages biological tissues by forming charged species that can disrupt molecular bonds. This fundamental phenomenon underlies diagnostic imaging and certain therapeutic procedures in dentistry.

2. (C) Gamma rays

   Gamma rays have frequencies higher than all other electromagnetic radiations listed, making them extremely energetic. They arise from nuclear transitions and can penetrate various materials due to their short wavelength. Microwaves (A) and infrared (B) occupy lower-frequency bands, whereas visible light (D) lies between infrared and ultraviolet ranges. Gamma rays' high-energy photons can ionize atoms, which is why they are used in sterilization, cancer treatment, and nuclear medicine. Their strong penetrative power also necessitates rigorous protective measures to safeguard operators. Understanding these differences is essential for proper clinical application in dentistry.

3. (B) Their photon energy causes ionization leading to molecular disruption

   X-rays have sufficient photon energy to displace electrons from atoms, creating charged particles that can break or alter molecular bonds. This ionization process initiates chemical reactions in cells and tissues, potentially damaging DNA and other critical structures. Contrary to the idea of large mass disruption (C), X-ray photons are massless but highly energetic. High-speed electrons (A) pertain more to beta radiation, and low penetrative capacity (D) is incorrect, as X-rays can pass through various tissues. Recognizing ionization's central role helps dentists minimize hazards through proper shielding and technique. This knowledge also guides dose optimization strategies and fosters safer diagnostic practices.

4. (C) They have a variable mass dependent on frequency

   X-rays are electromagnetic waves with no mass, regardless of their frequency. They travel at the speed of light (A), do not carry an electrical charge (B), and are typically generated when high-speed electrons impact a target (D). Claiming that they have variable mass (C) misconstrues their nature, as photons are massless yet possess energy dependent on frequency. This massless property underpins many of their physical behaviors, including penetration through tissues. Understanding such fundamental aspects allows dental professionals to anticipate image contrast and potential biological effects. Knowledge of correct X-ray properties informs safe clinical usage.

5. (C) Characteristic X-rays result from electron shell transitions, while bremsstrahlung arises from electron deceleration near the nucleus

   In dental X-ray tubes, characteristic radiation occurs when an incoming electron ejects an inner-shell electron from the target atom, prompting an outer-shell electron to fill the vacancy and release a photon with a discrete energy. Bremsstrahlung radiation, by contrast, originates when electrons slow down or change direction near the nucleus, emitting a range of photon energies. They are not identical in origin (D), nor do characteristic X-rays exhibit a continuous spectrum (B). Understanding these distinctions is crucial for adjusting beam quality

and image contrast in clinical radiography. Safe operation depends on mastering both mechanisms.

6. (B) Proper collimation

Collimation restricts the X-ray beam to the region of interest, reducing radiation exposure to surrounding tissues. While tungsten filtration (A) and an appropriate anode (C, D) contribute to optimizing beam quality, collimation provides the most direct method to minimize patient dose. By limiting scatter and focusing on the relevant anatomical area, collimation also enhances image quality, improving diagnostic accuracy. This targeted approach forms a cornerstone of radiation safety protocols, ensuring patients are protected while obtaining necessary diagnostic information. Consequently, collimation stands out as the single most effective measure to cut unnecessary exposure.

7. (D) Decreases contrast

Increasing kilovoltage enhances the penetrating power of X-ray photons, resulting in a wider range of gray tones on the radiograph. This broader latitude tends to reduce overall contrast by bringing out more subtle differences in tissue density. While magnification (A) is mostly influenced by geometric factors like source-to-object distance, sharpness (C) depends on focal spot size and motion. A higher kV technique helps visualize a more extensive range of anatomy but can make subtle pathologies less conspicuous if contrast is overly reduced. Optimizing kV balances diagnostic detail against radiation dose and contrast requirements.

8. (B) Adjust the patient's chin position

Blurring on panoramic images frequently arises from incorrect patient positioning, especially chin tilt, which can misalign the dental arches in the focal trough. By adjusting the chin to the correct level, the operator ensures the maxillary molars fall within the sharp focal layer. Lowering kilovoltage (A) adjusts beam penetration but does not address positioning errors. Reducing source-to-object distance (C) or adjusting film–screen contact (D) are more relevant to standard intraoral or extraoral radiographs. Proper positioning remains the best initial step to eliminate motion artifacts and achieve optimal panoramic clarity. This principle underpins correct panoramic technique for clear diagnostic results.

9. (D) Direct the central ray perpendicular to the bisector of the angle formed by the tooth and film

In the bisecting angle technique, the film is placed close to the tooth, and an imaginary bisector is drawn between the long axis of the tooth and the film. The central beam is then positioned perpendicular to this bisector (D), ensuring minimal distortion. Placing the film parallel to the tooth (A) corresponds to the parallel technique, while strictly aligning the beam perpendicular to the film (B) or placing the film at a fixed 45° angle (C) does not achieve the intended geometric principle. Correct bisecting method reduces image foreshortening or elongation for diagnostic accuracy.

10. (B) Position the chin too low intentionally

Proper panoramic imaging requires aligning the Frankfort plane parallel to the floor and ensuring the patient's chin is neither excessively raised nor lowered. Placing the chin deliberately too low can distort the mandibular region, producing an exaggerated smile line and blurring key anatomical landmarks. Removing jewelry (A) helps prevent artifacts, while the bite block (C) aids in consistent arches alignment. Maintaining correct posture and head orientation (D) are essential for a clear, diagnostic image. Such protocols reduce retakes, limit patient dose, and improve image quality in panoramic radiography. Adhering to these positioning steps maximizes the utility of panoramic examinations.

11. (B) Erythroblasts in bone marrow

According to Bergonié and Tribondeau, radiosensitivity is linked to cellular reproductive activity and metabolic rate. Erythroblasts in bone marrow proliferate rapidly, making them highly vulnerable to ionizing radiation. In contrast, mature nerve cells (A) and muscle fibers (C) rarely divide, so they exhibit lower sensitivity. Fully differentiated osteocytes (D) also divide infrequently. Rapidly dividing cells are more prone to radiation-induced DNA damage and cell death or mutation, emphasizing the importance of shielding active tissues during radiographic procedures. This

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principle guides safety measures, particularly in patients with high bone marrow activity.

12. (C) Increased image density but no effect on contrast

Milliampere settings determine the quantity of X-ray photons produced over a given exposure time. When mA is raised, more photons strike the film or sensor, resulting in higher radiographic density. Contrast primarily depends on kilovoltage and the nature of the tissues. Therefore, mA changes image darkness without significantly altering contrast. Reduced scatter (D) is more associated with collimation or lower kV. Maintaining optimal mA and exposure time ensures adequate image quality while minimizing patient dose, illustrating the importance of careful operator adjustments in clinical practice.

13. (C) Vertical bitewing radiograph

Vertical bitewings provide an extended view of alveolar bone levels, especially around posterior teeth. They are more reliable than standard horizontal bitewings for assessing bone loss in moderate to advanced periodontitis cases. Panoramic views (B) offer a broad overview but lack the detail needed for localized periodontal assessment. Occlusal views (A) mainly help visualize larger areas of the arch or impacted teeth, while a lateral oblique view (D) is limited for routine periodontal evaluation. Vertical bitewings help clinicians detect interproximal bone changes and guide periodontal treatment planning with enhanced accuracy in chronic periodontitis.

14. (A) Radicular cyst

A well-defined, corticated radiolucency at the apex typically indicates a radicular cyst, which results from pulpal necrosis and chronic inflammation. Osteosarcomas (B) usually show irregular, destructive patterns. Periodontal abscesses (C) might present with radiolucencies but often lack the distinct cortex. Cementomas (D) develop within the periodontal ligament space and exhibit mixed radiolucent-radiopaque patterns. A radicular cyst generally arises from nonvital teeth and can remain asymptomatic until discovered incidentally on radiographs. Correct interpretation guides further investigations, such as pulp vitality testing, and influences treatment planning, including possible endodontic or surgical management.

15. (C) Use the fastest receptor available in one session

Fast receptors, such as digital sensors or high-speed film, reduce the exposure time needed for diagnostic-quality images. Completing necessary radiographs in a single well-planned session prevents repeated setups and additional exposures. Spacing them over consecutive days (B) does not reduce total dose; it merely spreads it out. Performing them in scattered intervals (A) likewise adds no protective benefit. Sedation (D) may help with patient comfort but does not fundamentally reduce dose. Appropriate receptor selection remains a key factor in dose optimization while preserving image clarity for comprehensive dental assessment.

16. (B) Employing rectangular collimation and high-speed detectors

ALARA emphasizes using every practical method to limit patient exposure. Rectangular collimation restricts the X-ray beam to just the area of interest, sharply decreasing scattered radiation to surrounding tissues. High-speed detectors reduce the necessary exposure time to achieve diagnostic images. Round collimators (A) allow more stray radiation, and increasing exposure time (C) contradicts dose reduction. Limiting lead aprons (D) to children alone overlooks potential risks to adult patients. By integrating rectangular collimation, fast imaging systems, and protective shielding, clinicians uphold safety standards while ensuring optimal diagnostic results.

17. (B) Irregular radiolucency displaying a “sunburst” periosteal reaction

A “sunburst” periosteal reaction is highly suggestive of aggressive bone lesions, such as osteosarcoma, which necessitates prompt referral for advanced imaging and biopsy. Well-defined, sclerotic margins (A) typically indicate benign processes like cysts or fibrous lesions. Concentric layering (C) may hint at an ossifying fibroma. A uniformly radiopaque lesion near an impacted tooth (D) could be a dense bone island or other benign entity. When suspicious irregularities appear on dental radiographs, timely diagnosis and intervention can significantly influence patient outcomes, making immediate referral essential for suspicious periosteal reactions.

18. (D) Well-defined radiolucency with a radiopaque margin

Cystic lesions typically present as radiolucencies bordered by a well-circumscribed, sometimes sclerotic margin that appears radiopaque. The cotton wool pattern (A) is seen in Paget's disease, floating teeth (B) is often linked to aggressive lesions like malignancies or severe periodontal disease, and onion-skin periosteal reaction (C) appears in proliferative periostitis or Ewing's sarcoma. Recognizing the classic appearance of cystic lesions is crucial for timely diagnosis and treatment planning. A demarcated border often signifies a slower-growing, encapsulated process, guiding potential endodontic, surgical, or combined approaches for definitive management.

19. (A) Both A and R are true, and R is the correct explanation of A

Stochastic effects follow a probability-based model, meaning that even a small dose of radiation can potentially cause cellular changes leading to cancer. There is no established threshold for these effects, aligning with the assertion (A). The reason (R) accurately explains the randomness of mutations: they can occur at any level of exposure, but the frequency increases with higher doses. This rationale underpins dose-minimization strategies in dentistry, employing protective devices and limiting unnecessary radiographs. Understanding stochastic risk underscores why clinicians follow ALARA for all patient exposures, regardless of dose levels.

20. (A) Use of TLD or film badges on a monthly basis

Thermoluminescent dosimeters (TLDs) or film badges track cumulative radiation exposure, providing quantitative evidence of staff dose over time. Regular monitoring allows early identification of possible overexposures, prompting corrective action. Mandatory chest X-rays (B) do not serve as a reliable measure of occupational exposure and add unnecessary radiation. Sedation (C) and patient screening (D) address patient care but do not replace the need for direct operator dose assessment. Proper usage and periodic review of dosimeter readings form a cornerstone of occupational safety in dental radiology practices.

21. (B) Step wedge test

A step wedge test is performed by exposing a film or digital sensor through an aluminum step wedge, producing varying density levels. When conducted periodically, it reveals any fluctuations in output, indicating potential problems with the X-ray generator or processing conditions. The coin test (A) checks safelight efficacy in a darkroom, while collimator alignment (C) evaluates beam positioning. A safelight test (D) is specific to darkroom environments. The step wedge provides consistent, reproducible data to track machine performance and ensure diagnostic-quality images with minimal retakes in dental practice.

22. (B) Periapical paralleling technique

The periapical paralleling technique provides a highly detailed, dimensionally accurate image of a specific tooth and its supporting structures. In cases of suspected root resorption, clarity and minimal distortion are essential, making periapical films the choice. Occlusal radiographs (A) offer broader coverage but less detail, and panoramic images (C) generally lack the fine resolution needed for minor root changes. An MRI scan (D) can visualize soft tissue but is not typically used for routine root assessment. The paralleling method reduces distortion compared to bisecting angle, aiding precise measurement of resorptive changes.

23. (C) Extraoral bitewing technique

Extraoral bitewings adapt to patients with limited mouth opening, offering a view of interproximal bone and tooth contacts without the discomfort of intraoral film or sensors. Panoramic radiographs (A) provide a broad overview but have less resolution for detecting subtle alveolar crest changes. The lateral oblique jaw (B) is generally used for mandibular posterior evaluation but lacks standardized bitewing geometry. Occlusal radiographs (D) offer occlusal plane views but are less effective in interproximal detail. Extraoral bitewings preserve diagnostic information crucial for periodontal assessment while accommodating patient limitations.

24. (C) Full-mouth periapical series

A full-mouth periapical series provides detailed, high-resolution imaging of each tooth and surrounding bone, allowing for accurate detection

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of lesions, bone loss patterns, and root morphology. Chronic periodontitis with potential periapical involvement demands precise evaluation that surpasses the panoramic overview (B). While CBCT (A) yields three-dimensional data, it may not be the immediate first step due to higher radiation exposure and cost. A lateral oblique mandible view (D) can complement specific mandibular pathologies but is less comprehensive for a full diagnostic assessment. Thorough periapical imaging directs targeted periodontal or endodontic treatment planning.

25. (B) CBCT

Cone Beam Computed Tomography (CBCT) delivers three-dimensional visualization of bone architecture, enabling precise assessment of suspicious lesions in the jaw. The irregular radiolucency and numbness raise concern for malignancy or osteomyelitis, which necessitates detailed imaging to guide biopsy planning. Cephalometric analysis (A) focuses on orthodontic or facial growth measurements, and an occlusal radiograph (C) offers limited information. The lateral oblique mandible (D) can show broad regions but lacks the resolution and multiplanar reconstructions provided by CBCT. Early detection and accurate delineation of lesion boundaries are critical for intervention.

26. (B) The thickness of a material that reduces radiation intensity by half

The half-value layer (HVL) quantifies the penetrating power of X-rays, indicating how much material thickness—often aluminum or other metal—is required to attenuate the beam's intensity by 50%. A higher HVL reflects greater beam energy or quality. It does not double X-ray intensity (A), nor does it indicate the maximum penetration depth (C). It also differs from designating the shortest wavelength (D). Monitoring HVL helps determine appropriate filtration levels, ensuring the beam is suitably hardened for diagnostic imaging while maintaining patient safety through reduced low-energy radiation.

27. (B) Gray (Gy)

The gray (Gy) represents the absorbed dose, quantifying the amount of energy deposited by ionizing radiation in a unit mass of tissue. One gray corresponds to one joule per kilogram. Sievert (Sv) (C) is used for equivalent dose, reflecting biological impact of various radiations. Coulomb per kilogram (A) measures exposure in air, while the becquerel (Bq) (D) measures radioactive decay activity. Understanding the distinction among these units helps dental professionals interpret dosimetry reports accurately and uphold radiation safety standards when conducting diagnostic procedures in clinical practice.

28. (B) To reduce scattered radiation reaching the film

The lead foil backing absorbs a portion of backscatter radiation that could degrade image quality and increase patient dose. By minimizing scatter, it enhances the contrast and clarity of the final radiograph. Increasing film speed (A) is achieved through crystal design, not lead foil, while visible light sensitivity (C) is irrelevant to intraoral X-ray film. The film's flexibility (D) arises from its base material. Proper film composition, including lead foil, ensures efficient imaging, helping dentists capture diagnostic details while limiting unwanted radiation exposure to both patient and operator.

29. (D) Mercury

Mercury is not a standard component of dental X-ray tubes. Tungsten is used for the filament and target due to its high melting point and efficiency in producing X-rays. Copper surrounds the target to facilitate heat dissipation, and aluminum is employed as filtration material. Mercury has no role in generating or filtering diagnostic X-ray beams. Understanding the construction of the tube helps operators recognize maintenance requirements and the importance of selecting durable, heat-resistant metals. Properly functioning components ensure consistent radiation output, reliable image quality, and adherence to safety standards.

30. (C) Indirect sensors use a phosphor plate that requires scanning, whereas direct sensors instantly produce a digital image

Direct digital sensors, such as CCD or CMOS devices, communicate image data immediately to a computer, allowing rapid viewing. Indirect digital systems use photostimulable phosphor (PSP) plates that store latent images, needing subsequent scanning to convert them into digital files. Neither system requires chemical processing (B), which

is associated with film-based radiography. Direct sensors do not produce latent images on film (A). Understanding these operational differences assists clinicians in selecting the best technology based on cost, workflow, patient comfort, and diagnostic requirements. Immediate image availability often benefits efficiency and patient education.

31. (D) Bisecting angle with smaller film or sensor size

Employing a smaller receptor and using the bisecting angle technique can help minimize tissue contact that triggers the gag reflex, especially in posterior areas. Panoramic radiography (A) provides an overview but may not offer the necessary periapical detail. Rigid sensors without modifications (B) can exacerbate discomfort, and increasing exposure time (C) does not address the gag stimulus. By carefully positioning a smaller film and implementing bisecting geometry, clinicians achieve better tolerance and adequate diagnostic detail. Adapting technique to patient comfort is essential for quality imaging and successful patient management.

32. (B) Smaller focal spot producing sharper images

The smaller the focal spot, the lesser the penumbra (blur) on the resulting radiograph, leading to sharper images. A larger focal spot increases geometric unsharpness, reducing detail. This principle holds true for both intraoral and extraoral radiography. Contrast (C) is primarily governed by kilovoltage and film characteristics, while panoramic machines (D) also benefit from this principle, although they employ different geometries. Focal spot size is pivotal for achieving high-resolution images, particularly when fine details—such as root canal morphology or incipient caries—need to be accurately visualized in dental practice.

33. (C) Increase exposure time or mA

Underexposed images result from insufficient X-ray photons reaching the receptor. Increasing the exposure time or mA boosts the quantity of photons, improving overall density. Decreasing kilovoltage (A) or milliampere (B) would further lighten the image. Switching to a higher-grade film (D) is less direct; modern practices often employ digital sensors rather than film. Adjusting technical factors to achieve correct exposure is crucial for diagnostic clarity without unnecessarily raising patient dose. Observing strict quality control protocols ensures that each radiograph provides maximum information with minimal retakes.

34. (B) Through the open embrasure of the targeted teeth

A bitewing radiograph aims to capture open interproximal spaces for caries detection and bone level assessment. By directing the beam through the open embrasure, contact overlap is minimized, revealing clearer margins. Perpendicular alignment to the tooth's long axis (A) pertains more to periapical techniques, while oblique angles (C) and vertical midline orientation (D) can introduce overlapping or distortion. Proper horizontal angulation is essential for accurate interpretation of proximal surfaces, guiding early detection of carious lesions and better evaluation of alveolar bone height in routine dental examinations.

35. (C) Store them in humid areas to keep the plate surface moist

Phosphor storage plates require a clean, dry environment to maintain their integrity and avoid artifacts. Humid or moist conditions (C) can damage the phosphor layer or induce fungal growth. Protecting the plates from ambient light (A) and debris (B) ensures consistent image quality. Erasing residual images (D) after use prevents double exposure. Proper handling extends the life of PSP plates and preserves diagnostic accuracy. Using suitable storage cases, maintaining moderate temperature, and following manufacturer guidelines are essential to prevent plate degradation and guarantee reliable, high-quality imaging results.

36. (A) Infants and children

Younger patients are more radiosensitive due to higher cellular proliferation rates and longer remaining lifespan, providing a wider window for potential stochastic effects like carcinogenesis to manifest. Middle-aged adults (B) and the elderly (C) have comparatively fewer dividing cells and a shorter latency period. Although everyone should be safeguarded, children require extra caution to minimize dose. This is why pediatric guidelines emphasize conservative selection criteria, shield usage, and optimal exposure settings. Recognizing the heightened vulnerability of growing tissues

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informs tailored imaging protocols in pediatric dentistry to reduce long-term risks.

37. (B) More magnification and less sharpness

A shorter focal film distance (FFD) means the X-ray source is closer to the film or sensor, increasing the divergence of rays reaching the receptor. This results in greater magnification and a larger penumbra, diminishing image sharpness. Extending FFD typically reduces magnification and improves detail. Density and contrast (C) are more dependent on exposure settings (mA, kV, and exposure time) and object composition. Image geometry (D) is directly influenced by distances and angulations, making FFD a critical factor in producing high-quality radiographs without excessive distortion.

38. (B) CBCT

Cone Beam Computed Tomography (CBCT) provides three-dimensional visualization, allowing detection of subtle vertical root fractures that might be invisible on two-dimensional radiographs. Panoramic (A) and occlusal (C) views lack fine detail for tiny fracture lines, and MRI (D) is more suited to soft tissue imaging. By evaluating the tooth in multiple planes, CBCT reveals fractures or complex anatomy otherwise masked. This enhanced diagnostic capability supports timely treatment decisions, such as retreatment or extraction, depending on fracture severity. Dentists often rely on CBCT in challenging endodontic cases for improved accuracy.

39. (B) An enlarged pulp chamber with uniform radiolucency

Internal resorption manifests as a radiolucent expansion of the pulp chamber or canal, often giving a ballooned appearance. Radiopaque masses (A) suggest calcifications or pulp stones. External root resorption (C) arises on the external surface of the root. A thickened lamina dura (D) typically indicates adaptation to an altered occlusal load or healing. Confirming internal resorption often requires angled periapical views or CBCT to assess the extent of the lesion. Early detection is critical since progressive resorption can compromise structural integrity, demanding timely endodontic intervention to preserve the tooth.

40. (B) Retake only the specific radiograph

Limiting retakes to the single deficient view prevents unnecessary radiation from re-exposing multiple regions. Repeating an entire series (A) multiplies dose without clinical justification, contradicting ALARA principles. Increasing mA (C) could reduce exposure time but doesn't address the positioning error itself. Delaying radiographs (D) may be inappropriate if immediate diagnostic information is needed. By identifying the incorrectly positioned image and correcting the technique, the dentist obtains the necessary data while minimizing additional patient exposure. Careful execution of each retake preserves diagnostic quality and adheres to radiation safety protocols.

41. (C) Every 3–5 years

Current guidelines encourage individualized radiographic schedules based on risk factors rather than rigid intervals. For healthy adult patients with low caries risk and no significant periodontal or other oral health issues, a panoramic radiograph every 3 to 5 years can help identify emerging pathologies. More frequent imaging (A, B) can lead to unnecessary radiation exposure, while dismissing panoramic evaluations altogether (D) may miss progressive conditions. Clinicians must also consider patient history, clinical examination, and special risk factors—such as a history of impacted teeth or jaw pathology—when scheduling radiographs.

42. (C) A solitary, well-defined radiolucency in the ramus region of unknown origin

A solitary radiolucency with no clear etiology calls for further diagnostic steps such as additional periapical imaging, CBCT, or referral. While some benign cysts or tumors may appear well-demarcated, further assessment is necessary to rule out malignancies or other serious conditions. Symmetrical condyles (A), continuous lamina dura (B), and impacted third molars in a predictable position (D) are often incidental findings that do not necessarily imply pathology. Recognizing suspicious radiolucencies is paramount for early detection, allowing timely intervention and a better prognosis for potential lesions.

43. (A) Thickening of the periodontal ligament space

Early periapical inflammation often manifests as a slight widening of the periodontal ligament (PDL) space, reflecting edema or initial bone resorption around the root apex. Hypercementosis (B) can be a chronic adaptive response. Root fusion (C) is typically developmental, not pathologic, while sclerotic bone (D) might indicate healing or reaction to long-standing inflammation. Detecting subtle changes in PDL space helps identify early periapical issues, prompting timely endodontic evaluation and preventing further bone destruction. Regular monitoring of such signs supports better outcomes through timely intervention and treatment planning.

44. (D) A is false, R is true

Filtration primarily removes low-energy photons, not high-energy ones. Low-energy radiation increases patient dose without significantly improving the image. The reason (R) is accurate: filtration is meant to eliminate long-wavelength photons that are more readily absorbed by tissues, offering little diagnostic benefit. Thus, the assertion (A) is incorrect, whereas the reason (R) precisely explains the principle behind filtration. This distinction underscores the importance of correctly designing filtration to optimize the X-ray beam, lowering unnecessary dose while preserving image quality in dental radiography.

45. (A) 0.5 mm

A 0.5 mm lead-equivalent apron is commonly advised for dental radiography to shield the operator and patient from scatter radiation. This thickness typically balances protection with wearer comfort. Thicker aprons (C, D) may be used in higher-dose procedures but can be cumbersome for routine dental work. Anything significantly thinner (B) may provide insufficient attenuation. Protecting the thyroid and gonads is particularly important, and many aprons feature a collar attachment for thyroid shielding. Consistent use of protective aprons supports compliance with ALARA and regulatory guidelines for radiation safety.

46. (B) Coin test

The coin test is a simple method to evaluate safelight adequacy. By placing a coin on unexposed film in the darkroom under safelight conditions, any outline of the coin after processing indicates excessive safelight exposure or light leaks. The step wedge test (A) checks radiation output constancy, focal spot tests (C) evaluate resolution, and the timer accuracy test (D) verifies exposure times. Identifying and correcting safelight deficiencies ensures film remains unexposed until used, preserving accurate image density and contrast. Despite digital advances, some practices still rely on film workflows.

47. (A) Maxillary occlusal radiograph

A maxillary occlusal radiograph offers a broad view of anterior teeth and can reveal supernumerary teeth, impacted canines, or other anomalies in pediatric patients. Bitewings (B) focus on interproximal surfaces of posterior teeth, while panoramic imaging (C) may not provide the fine detail of smaller anomalies in the anterior region. Periapical paralleling (D) could be challenging for small mouths with limited opening and might miss the larger field needed to identify extra teeth. Occlusal views are often more comfortable for children and offer a comprehensive anterior perspective.

48. (C) Mandibular occlusal radiograph

Mandibular occlusal radiographs capture a broad view of developing tooth buds in the anterior region, making them ideal when periapical films are difficult for pediatric patients. Panoramic views (B) may suffice for overall jaw development but might not deliver the detail needed for specific anterior anomalies. Lateral oblique (A) and extraoral bitewings (D) focus on posterior or lateral structures. The occlusal approach is more comfortable for restricted mouth openings and effectively reveals supernumeraries or other developmental issues near the midline. Accurate imaging supports better treatment planning in orthodontic cases.

49. (B) Water's view

The Water's (occipitomental) view projects the maxillary sinuses clearly, aiding in diagnosing sinusitis or odontogenic infections extending into the sinus region. It offers a dedicated assessment of the maxilla, unlike the posteroanterior skull (A) or submentovertex (D), which are more general. A maxillary occlusal radiograph (C) focuses mainly on dental arches and may not show sinus involvement.

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Chronic infections in the premolar region can perforate into the sinus, and a Water's view helps delineate such pathological communication. Appropriate imaging directs further management, whether surgical intervention or endodontic therapy, to resolve the chronic lesion.

50. (C) CBCT

Cone Beam Computed Tomography (CBCT) is the most informative choice for visualizing bony architecture, potential defects in the palate, and the relationship with the maxillary sinus. Panoramic radiographs (B) offer a broad overview but lack the fine detail and three-dimensional perspective essential for diagnosing oroantral communications. Occlusal views (A) and lateral skull (D) images may provide partial information but can miss critical anatomical details. CBCT's multiplanar reconstructions allow clinicians to pinpoint the defect, evaluate sinus involvement, and plan treatment or surgical repair for improved denture fit and function.

51. (B) The extent to which the radiographic image is larger than the actual object

Magnification factor describes how much the recorded image on a radiograph exceeds the true dimensions of the tooth or anatomical structure. It depends on distances between the X-ray source, object, and receptor. A longer source-to-object distance and a shorter object-to-film distance produce less magnification. Incorrectly positioning these distances can enlarge the image beyond diagnostic usefulness. Option (A) relates to focal spot geometry rather than magnification, while radiopacity differences (C) concern contrast. Penumbra (D) affects sharpness, not the overall enlargement. Controlling magnification is crucial for accurate interpretation and reliable clinical measurements.

52. (B) Ultrasound

Ultrasound imaging employs high-frequency sound waves directed into tissues, which reflect differently depending on tissue density and structure. The returning echoes are interpreted by a computer to create real-time images. In dental applications, ultrasound can help assess soft tissue lesions, measure the thickness of the tongue or floor of the mouth, and evaluate temporomandibular joint (TMJ) pathology when bony details are less critical. Computed Tomography (A) and MRI (C) rely on ionizing radiation or magnetic fields, while digital subtraction radiography (D) compares sequential radiographs for changes over time. Ultrasound avoids radiation exposure, favoring noninvasive assessments.

53. (B) It reliably distinguishes small changes in bone density between two time points

Digital subtraction radiography compares two radiographic images taken at different intervals, effectively highlighting gains or losses in bone density by subtracting one digitized image from the other. Even subtle changes become more apparent, aiding in early detection of bone loss or regeneration. However, standardizing the imaging technique is vital (countering A), and at least two exposures are needed (disputing C). While positioning errors can still occur (D), meticulous alignment reduces artifacts and provides consistent comparisons. This enhanced sensitivity makes digital subtraction radiography invaluable for monitoring periodontal status and evaluating treatment outcomes over time.

54. (D) High-detail enamel thickness analysis

MRI excels at demonstrating soft tissues, such as TMJ articular discs and associated ligaments, or detecting pathology like tumors within and around the jawbones and soft tissues. It can also reveal marrow changes in early inflammatory or malignant processes. However, MRI does not capture enamel thickness in high detail because enamel is dense, calcified tissue and yields limited signal with standard MRI protocols. CT scans or CBCT are superior for precise visualization of hard tissues, including enamel. This limitation makes MRI an invaluable but not all-encompassing modality for comprehensive dental evaluations.

55. (C) CBCT often delivers a reduced dose and a focused field of view

Cone Beam Computed Tomography (CBCT) in dentistry uses a cone-shaped beam and a single rotation to capture volumetric data. Its design commonly targets smaller fields of view relevant to oral structures, thereby lowering radiation dose compared to a conventional medical CT scan.

Conventional CT (A) generally employs higher doses for multislice or helical acquisitions. CBCT (B) indeed provides 3D volumetric data, not just 2D slices. Both technologies can visualize soft tissues to varying extents (D), though MRI remains superior for soft-tissue contrast. Dentists favor CBCT for implant planning, pathologic evaluations, and orthodontic assessments with minimized exposure.

56. (B) Sialography

Sialography involves introducing a radiopaque contrast medium into the salivary gland duct, then capturing images to visualize duct anatomy, potential obstructions, strictures, or stones (sialoliths). Although MRI (A) can display glandular tissue without radiation, it may not clearly highlight small ductal blockages. Nuclear scintigraphy (C) can show functional uptake and excretion but lacks precise ductal detail. Digital subtraction radiography (D) is more suitable for comparing bony changes over time. Sialography remains a direct and sensitive method for delineating duct morphology, assisting in targeted treatments for salivary gland disorders.

57. (C) Ensure removal of metallic objects prior to imaging

Ghost images commonly arise from dense objects positioned between the X-ray source and the rotation center, typically leading to a second, indistinct, higher image on the opposite side. Jewelry, eyeglasses, or hairpins can generate such artifacts, obscuring diagnostic details. Simply adjusting exposure parameters like time (A) or kilovoltage (B) will not eliminate these overlapping images. Instructing the patient to swallow (D) helps position the tongue, but does not eliminate metallic artifacts. Thoroughly removing metallic or dense objects is the best step to produce a clear, artifact-free panoramic examination.

58. (C) Cone Beam Computed Tomography (CBCT)

CBCT offers three-dimensional imaging of dental and maxillofacial structures at lower doses compared to a conventional medical CT. This technology generates multiplanar reconstructions for a comprehensive view of the lesion's size, location, and relationship to critical structures like the inferior alveolar canal. A full-mouth periapical series (A) or occlusal radiograph (D) only produce 2D images, limiting lesion characterization. While high-dose conventional CT (B) can also yield cross-sectional images, it generally delivers more radiation. CBCT achieves diagnostic clarity ideal for small to moderate maxillofacial lesions, guiding treatment decisions or biopsy planning efficiently.

59. (B) Wear a thyroid collar to minimize radiation to the thyroid gland

Protecting radiosensitive organs like the thyroid is paramount in CBCT procedures. A properly fitted thyroid collar reduces scattered radiation without compromising the image field. Although rinsing with chlorhexidine (A) might be routine for other procedures, it doesn't reduce radiation exposure. Analgesics (C) aren't explicitly required unless the patient has pain, and sedation (D) is typically unnecessary if the patient can cooperate. Limiting radiation to the thyroid aligns with ALARA principles, ensuring safety while capturing high-resolution data for implant positioning, bone density assessments, and proximity to vital anatomical structures.

60. (C) Using a lead apron without a thyroid collar

During panoramic imaging, proper positioning and patient instructions are crucial for a clear, artifact-free image. The tongue should contact the palate (A) to eliminate palatoglossal air space, and the Frankfort plane must be parallel to the floor (B). The patient should also bite onto the block in the correct position (D) to align the dental arches within the focal trough. A lead apron with a thyroid collar is recommended to protect sensitive tissues, including the thyroid gland. Omitting the thyroid collar can unnecessarily expose the patient's neck region to scatter, contradicting best safety practices.

61. (D) Thyroid gland

During intraoral radiography, the thyroid gland is relatively close to the primary beam path in many head and neck views, increasing scatter radiation exposure. Thus, protective measures like a thyroid collar are critical. The cervical spine (A) lies behind the oral cavity but receives less scatter with proper collimation. Gonads (B) are distant and receive negligible doses from a focused beam, though protective aprons are still advised for standard precaution. Contralateral parotid gland (C) is

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shielded by bone and distance. Ensuring appropriate beam alignment and utilizing protective devices helps reduce thyroid exposure significantly.

62. (C) Foreshortening or elongation of tooth length

Vertical angulation errors directly affect how the tooth's long axis projects on the film or sensor, resulting in exaggerated or shortened images. Excessive angulation typically causes foreshortening (the tooth appears shorter), whereas insufficient angulation leads to elongation (the tooth appears longer). Overlapping contacts (A) stem from horizontal angulation problems. Motion blur (B) arises when the patient or sensor moves during exposure. Double exposure (D) is an operator error when the same film or plate is exposed twice. Correct vertical angulation is essential for accurate anatomical representation in periapical radiography.

63. (D) CBCT

Cone Beam Computed Tomography (CBCT) offers a three-dimensional assessment at a lower dose compared to conventional CT, making it the preferable next step when significant bone lesions are suspected. Although MRI (A) excels in soft-tissue contrast, it is typically more expensive, longer in scan time, and less detailed for hard-tissue delineation. A lateral oblique view (B) can provide a broad outline but lacks the detailed 3D reconstruction needed for planning. Conventional CT (C) could characterize the lesion thoroughly but usually delivers a higher dose. CBCT strikes a balance by mapping bone lesions accurately while limiting radiation.

64. (B) Ameloblastoma

A multilocular "soap bubble" or "honeycomb" radiolucency is classically linked with ameloblastoma, a benign but locally aggressive odontogenic tumor often arising in the mandible's molar-ramus region. Periapical cysts (A) typically present as unilocular lesions around nonvital teeth. Paget's disease (C) frequently exhibits a "cotton wool" appearance in later stages. Osteoradionecrosis (D) results from irradiated bone failing to heal properly, often showing mixed radiolucent-radiopaque or necrotic changes rather than a multilocular pattern. Radiographic features, alongside histopathological findings, confirm ameloblastoma's diagnosis and guide surgical planning due to its infiltrative nature.

65. (C) Calibrating the X-ray output using a step wedge or reference device

A daily calibration (often using a step wedge) verifies that the X-ray unit consistently produces the correct exposure parameters for diagnostic image quality. Deviations might indicate tube performance issues or sensor calibration drift, resulting in suboptimal images or unnecessary radiation. Checking vacuum seals (A) is more periodic than daily. Cable length (B) doesn't affect exposure parameters day-to-day. Lead apron integrity tests (D) are usually performed at set intervals, not necessarily daily. Consistent baseline readings from a standardized test object ensure reliable operation, reduced retakes, and adherence to radiation safety standards.

66. (C) Maintaining at least 6 feet and a 90–135° angle from the X-ray source

Dental practitioners should stand a minimum of six feet away from the primary beam and position themselves within a 90–135° angle from the X-ray tube head to significantly reduce scatter exposure. Standing next to the patient (A) or holding the film (D) is discouraged due to increased occupational dose. Open-ended position-indicating devices (PIDs) (B) can be acceptable only if properly collimated; rectangular collimation is usually advocated for dose reduction. Following these guidelines—distance, position, and shielding—helps achieve ALARA for operators. Proper operator technique remains essential to minimize cumulative exposure over a professional career.

67. (C) A poorly defined, mottled radiolucency with cortical bone destruction

Aggressive lesions such as osteomyelitis or malignancies can present radiographically as ill-defined or mottled areas of bone destruction with cortical erosion. This warrants urgent investigation with advanced imaging and often a biopsy. Small, sclerotic-bordered radiolucencies (A) frequently represent benign processes like periapical granulomas or radicular cysts, especially if localized. Large unilocular lesions that displace teeth (B) might be cystic or benign tumors, though further assessment is still required. Radiopaque

lesions at a healed extraction site (D) may indicate sclerotic bone or other benign changes. The combination of bone destruction and poor definition raises immediate suspicion of possible malignancy.

68. (C) A well-defined radiolucency with a corticated border

A radicular cyst typically appears as a well-defined periapical radiolucency, often showing a thin corticated rim. Over time, a periapical granuloma can develop into a cyst, which remains confined around the apex of a nonvital tooth. Rapid multilocular expansion (A) suggests aggressive pathologies like ameloblastoma or odontogenic myxoma. Diffuse radiopacity (B) doesn't align with a cystic structure. Patchy translucencies with calcifications (D) could suggest a calcifying odontogenic cyst or other mixed lesion. Clear, corticated periapical boundaries are classic features of radicular cysts, directing further endodontic or surgical management.

69. (C) A is true, R is false

Rapidly dividing cells, such as those in bone marrow or the gastrointestinal epithelium, are indeed more radiosensitive because their DNA is frequently replicated, and any damage is more likely to be lethal or mutagenic. However, radiation-induced cell death is primarily driven by DNA damage, not mitochondrial damage. While mitochondria can be affected, the nucleus and DNA represent the main target for lethal radiation effects, especially concerning cell reproductive integrity. Because the reason statement misattributes the site of primary damage, it is false, whereas the assertion regarding high radiosensitivity of rapidly dividing cells is correct.

70. (B) Standing behind a protective barrier or wall

A protective barrier or lead-lined wall provides the most direct method to block scatter radiation. Even short exposures, if repeated many times per day, add to cumulative dose. Although raising kV (A) can reduce exposure time, it may also increase scatter if not properly controlled. A rotating anode (C) mainly aids heat dissipation. Regular machine calibration (D) ensures consistent output but does not inherently shield the operator from scatter. Consistently positioning oneself behind a designated barrier, coupled with adherence to recommended distance and angle protocols, remains the most dependable approach to minimize occupational exposure.

71. (B) Collimator test

The collimator test ensures the X-ray beam is correctly aligned with the receptor, preventing cutoff or cone cuts and minimizing exposure outside the target area. It often involves examining if the beam covers the same region intended on the film or sensor. A step wedge test (A) assesses output consistency. The half-value layer test (C) measures beam quality and filtration. The coin test (D) checks darkroom safelight conditions in film-based setups. Proper collimator alignment conserves radiation and improves image quality by directing the beam precisely where it's needed for accurate intraoral diagnoses.

72. (B) Submentovertex (SMV) view

The submentovertex (SMV) view is specifically designed to highlight the zygomatic arches by projecting them laterally, making it easier to identify fractures. Towne's view (A) is useful for the occipital region and condyles, while Water's view (C) focuses on the maxillary sinuses and orbital rims. A lateral cephalogram (D) is primarily for orthodontic measurements, including soft tissue profiles and jaw relationships. In suspected zygomatic arch fractures, the SMV best demonstrates displacement or arch disruption, guiding further intervention. Identifying any arch fracture accurately is crucial for timely oral and maxillofacial surgical management.

73. (B) MRI

Magnetic Resonance Imaging (MRI) offers excellent visualization of soft tissues, including the articular disc, retrodiscal tissue, and joint capsule. It doesn't rely on ionizing radiation, making it ideal for TMJ disorders where disc displacement, inflammation, or degenerative changes are in question. Although CBCT (A) excels at hard-tissue details, it doesn't adequately capture disc structures. Lateral oblique jaw views (C) and plain TMJ radiographs (D) depict primarily osseous components and might not fully reveal disc pathology. MRI helps confirm disc displacement or degenerative changes, enabling targeted management for orofacial pain and TMJ dysfunction.

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74. (B) CBCT

Cone Beam Computed Tomography (CBCT) furnishes a high-resolution, three-dimensional representation of maxillary bony anatomy and sinus floor continuity. In cases of oroantral fistula, viewing the exact defect size, location, and bone thickness is essential for surgical planning. Conventional periapical images (A) are limited by a two-dimensional perspective and may be challenging in an edentulous area. Occlusal radiographs (C) help outline alveolar contours but lack detailed sinus evaluation. The Water's view (D) highlights the sinuses but has limited utility for comprehensive bony detail. CBCT guides the surgeon in planning a reliable closure technique.

75. (C) CBCT

Cone Beam Computed Tomography (CBCT) generates detailed cross-sectional images of the mandible at a lower dose than conventional medical CT, enabling precise evaluation of implant proximity to the mental foramen and inferior alveolar canal. MRI (A) lacks the same detail for hard tissues, making it less optimal for measuring distances between the implant and nerve canal. Conventional CT (B) can provide that data but typically involves higher radiation. Occlusal radiographs (D) are two-dimensional, limiting accurate localization. By pinpointing implant positioning relative to neural structures, CBCT guides potential corrective measures to alleviate nerve impingement.

76. (B) By amplifying the X-ray beam to reduce exposure times

Intensifying screens contain phosphors that fluoresce when struck by X-rays, producing light that then exposes the film. Because film is more sensitive to visible light than direct X-rays, this amplification effect reduces the required dose for diagnostic imaging. The screens do not convert light to X-rays (A) or specifically filter scattered radiation (C). They also are not digital sensors (D). By producing a higher percentage of light photons from relatively few X-ray photons, intensifying screens shorten exposure times, thus diminishing patient dose in panoramic and other extraoral radiographic procedures.

77. (D) Neurons

Neurons, especially those in the adult central nervous system, seldom divide and are thus comparatively radioresistant. Rapidly dividing tissues like the lymphoid system (A) and mucous membranes (B) are more radiosensitive. Salivary glands (C) can be damaged by moderate to high doses, leading to xerostomia, but they are not as resistant as non-dividing neurons. The law of Bergonié and Tribondeau posits that cells with lower mitotic rates and higher specialization generally exhibit less radiosensitivity. Understanding this hierarchy helps clinicians apply protective measures, especially in higher-dose settings like head and neck radiation therapy.

78. (B) It produces a more accurate representation of tooth length without magnification

The paralleling technique aligns the film or sensor parallel to the tooth's long axis and directs the central ray perpendicular to both, minimizing distortion and magnification. While it often requires a slightly longer object-to-film distance, the geometry preserves true tooth proportions. In contrast, the bisecting angle technique can introduce foreshortening or elongation if the angle is off. Bisecting is sometimes used for challenging patient anatomies but is not necessarily more consistent (C). Some patients may find paralleling more complicated due to positioning devices (D), yet the resulting images typically boast superior diagnostic accuracy.

79. (D) Using lower kilovoltage without adjusting other parameters

Lowering kilovoltage alone can lead to underexposed images, necessitating retakes and ultimately increasing overall dose. A balanced approach is crucial; if kV decreases, one may need to adjust mA or exposure time to maintain diagnostic quality. Conversely, employing high-speed detectors (A) shortens exposure time, reducing dose. Rectangular collimation (B) limits radiation to the area of interest, and minimizing retakes (C) cuts unnecessary exposure. Proper technique, including correct exposure parameters, ensures ALARA compliance. Merely lowering kV can compromise image clarity, risking additional exposures—negating any theoretical dose savings and failing to protect the patient.

80. (C) T2 shows fluid as bright, whereas T1 typically shows fluid as darker

In MRI, T2-weighted images emphasize differences in the transverse relaxation times of tissues, commonly displaying fluid or edema as hyperintense (bright). T1-weighted images highlight fat as bright, while fluids or liquids generally appear darker in comparison. These differences help radiologists and clinicians distinguish between tissue types, inflammation, or pathological fluid accumulations. With T2's bright fluid signal, evaluating cystic lesions, joint effusions, or edema becomes more straightforward. Conversely, T1 images excel at depicting anatomical detail and fatty tissues. Understanding these fundamental variations assists dental practitioners in interpreting TMJ or soft tissue MRI scans.

81. (C) CBCT with limited field of view

Limited field-of-view CBCT scans offer high-resolution, localized imaging of specific areas, reducing scatter and artifacts while targeting the site of interest. This approach is well-suited for detecting vertical root fractures, which can be very subtle on conventional 2D radiographs. MRI (B) provides excellent soft tissue detail but is less sensitive for fine fractures. Panoramic films (A) give a broad overview but insufficient detail for micro-fractures. A full conventional CT (D) typically subjects the patient to higher radiation than necessary. Hence, a carefully targeted CBCT scan is optimal for diagnosing suspected vertical root fractures.

82. (D) Distortion or incorrect angulation of the maxillary and mandibular arches

For panoramic imaging, the Frankfort plane (running from the infraorbital rim to the external auditory meatus) must be parallel to the floor. If the chin is tipped too far down or up, the arches will be distorted, creating a "smile" or "frown" appearance on the film. Vertical magnification alone (A) is not the principal error. Insufficient horizontal coverage (B) usually stems from incorrect midline positioning or centering. Ring artifacts (C) can appear with certain digital plate defects but aren't specifically tied to Frankfort plane misalignment. Correct head positioning ensures reliable, undistorted panoramic images.

83. (D) None of these methods adequately evaluate metal frameworks

Radiographic modalities such as periapical films, MRI, and CBCT are primarily designed to assess tooth and bone structures (and soft tissues in MRI). Metal prostheses often cause scatter or artifacts, and these imaging methods cannot reliably reveal subtle thickness issues or localized stress points in the metallic framework. Radiographs can highlight major fractures or misfit frameworks but lack the resolution for precise metal thickness analysis. If recurrent fractures occur, the best recourse is to use direct visual inspection, measurement tools, or consult a lab-based approach (like a micro-CT or specialized nondestructive testing) rather than conventional dental radiographs.

84. (B) Windowing/leveling

Windowing/leveling modifies the grayscale range displayed on the monitor, highlighting subtle differences in tissue density within the captured data set. This post-processing operation does not change the stored raw data but temporarily adjusts how the image appears for diagnostic interpretation. DICOM editing (A) relates to data format manipulation but can risk data integrity if not done carefully. Printing onto film (C) is simply an output option, and phosphor plate erasure (D) prepares PSP plates for reuse but doesn't improve detail. Windowing/leveling is invaluable for emphasizing faint fractures or minor pathologies in digital images.

85. (C) Reusing disposable bite blocks if only used once

Disposable bite blocks are single-use items meant to minimize cross-contamination. They must be discarded after patient use, regardless of how briefly they were employed. Covering the sensor with a plastic sleeve (A) prevents saliva contamination, while disinfecting surfaces like the tube head, control panel, and chair (B) reduces pathogen spread. Wearing gloves (D) is also mandatory to protect both patient and operator. Although some positioning devices can be heat-sterilized if designed for multiple uses, anything specifically labeled "disposable" must be disposed of. This rigorous approach adheres to standard infection control and safety in radiographic procedures.

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86. (C) Pediatric patients

Children's developing tissues, including the thyroid gland, are more vulnerable to ionizing radiation's carcinogenic effects. They have a higher mitotic index, more extended post-exposure lifespan, and potentially more years in which malignancies can manifest. Older adults (A, D) typically show less risk due to lower cell turnover and shorter remaining life spans. Middle-aged females (B) may carry some risk, but it's still lower compared to pediatric patients. Consequently, using thyroid collars and following ALARA for pediatric radiographs is crucial. Radiographic recommendations prioritize shielding children's thyroids to prevent avoidable risk, preserving long-term health outcomes.

87. (B) Anterior teeth appear narrowed

When a patient is positioned too far forward in the panoramic unit, the anterior teeth lie ahead of the focal trough, causing them to appear narrower and out of proportion. Conversely, if the patient is too far back, the anterior teeth look magnified. Ghost images (C) typically occur from external objects or bilateral bony structures. Uniform radiopacity (D) might suggest an overexposed or incorrectly processed image, not a geometric error. Proper positioning ensures that the dental arches align with the machine's focal layer, generating an undistorted, diagnostically useful panoramic radiograph.

88. (C) Use individualized radiographic selection criteria

Patients receiving head and neck radiotherapy face heightened risk of tooth decay (radiation caries) and osteoradionecrosis, demanding ongoing dental assessment. Still, additional radiation exposures must be minimized. An individualized radiographic selection policy bases each exposure on specific clinical findings and risk factors, rather than preset intervals. Monthly panoramic radiographs (A) or frequent full-mouth series (B) might unduly increase cumulative dose in tissues already under radiation stress. Avoiding all radiographs (D) can miss emergent pathology until it becomes severe. Tailoring the frequency and type of imaging to each patient's condition harmonizes early detection with radiation safety.

89. (B) Calcified lymph node

A calcified lymph node in the submandibular region can appear as a well-defined radiopacity below the mandible on panoramic films, distinct from sialoliths that typically align along the duct path or near the submandibular gland's duct. Osteomas (C) arise from bone, while compound odontomas (D) form tooth-like structures within the jaw, not in the soft tissue below. Identifying a calcified lymph node often requires correlation with clinical history (e.g., infection or past inflammation). Confirmatory imaging or biopsy might be necessary if there's any doubt, ensuring appropriate management or further evaluation.

90. (C) Conduct a thorough evaluation of operator technique and equipment calibration

When personal dosimeter readings are unexpectedly high, the initial response involves investigating potential causes, including operator positioning, safety protocols, and machine performance. Incorrect technique (e.g., standing too close or in the primary beam's path) or faulty equipment (poor collimation, calibration drift) can elevate doses. Suspending radiographs (A) or dismissing staff (B) is unwarranted without thorough assessment. Switching exclusively to panoramic radiography (D) doesn't guarantee lowered operator exposure if the problem is procedural. A systematic review of training, protective barriers, exposure settings, and device function helps identify root issues, enabling corrective measures that maintain safe working conditions.

91. (C) ICRP recommendations

The International Commission on Radiological Protection (ICRP) provides widely recognized guidelines to ensure radiation safety, advising on dose limits, protective protocols, and justification for exposures. These principles guide regulatory bodies worldwide and inform professionals on best practices like ALARA (As Low As Reasonably Achievable). HIPAA (A) pertains to patient privacy, not radiation. OSHA's Bloodborne Pathogens Standard (B) focuses on infection control, not radiology. The ADA Code of Ethics (D) covers broader ethical obligations, not detailed radiation protection measures. ICRP recommendations remain the cornerstone for safeguarding patients

and dental professionals during diagnostic or therapeutic radiation use.

92. (B) Generalized thinning or loss of the lamina dura around teeth

A classic radiographic sign of hyperparathyroidism is generalized thinning or outright absence of the lamina dura. This can also manifest in other systemic diseases affecting bone turnover or mineral metabolism. Normal lamina dura with multiple retained roots (A) suggests local factors, while pulp calcifications (C) can occur due to aging, trauma, or other local conditions. Bilateral mandibular tori (D) are benign anatomical variations. Recognizing lamina dura changes is crucial for identifying possible endocrine disorders. Confirmation requires further clinical and laboratory investigations, including serum calcium, phosphate, and parathyroid hormone levels, to diagnose systemic causes.

93. (B) A distinct radiolucent rim around the crown's pericoronal space

A dentigerous cyst typically surrounds the crown of an unerupted tooth, presenting as a well-defined, unilocular radiolucency attached at the cementoenamel junction. This leads to a pericoronal radiolucent space that's characteristically wider than normal. Radiopacity over the crown (A) might suggest developmental enamel irregularities or other pathologies. Root resorption of adjacent teeth (C) can happen with various cystic or tumorous lesions, but a dentigerous cyst is specifically pericoronal. Onion-skin periosteal reactions (D) often align with inflammatory or proliferative conditions like osteomyelitis or Ewing's sarcoma. Recognizing these radiographic patterns directs accurate diagnosis and treatment planning.

94. (A) Both A and R are true, and R is the correct explanation of A

In panoramic radiography, the X-ray beam originates from below the patient's mandibular angle, curving upward around the head. This geometry generally skirts the thyroid gland. Because of this, many panoramic units recommend removing standard thyroid collars to avoid interfering with the path of the beam or causing artifacts. While a lead apron remains standard, a thyroid collar can create ghost images or block part of the panoramic field. So, the statement that it is optional (A) is correct, and the reasoning (R), which notes minimal direct thyroid exposure in panoramic techniques, validly explains why.

95. (B) Use a Snap-A-Ray or positioner with a more comfortable approach

When repeated attempts occur, retakes significantly increase the cumulative dose. Employing a positioning device tailored to the patient's anatomy—like a Snap-A-Ray or similar holder—can stabilize the film or sensor in a manner that reduces gag reflex or discomfort. This typically improves accuracy on the next try. Simply persisting with repeated failed exposures (A) escalates dose unnecessarily, while increasing exposure time (C) might not resolve positioning issues. Ceasing all attempts (D) could miss essential diagnostic information. A better device or approach typically fosters patient cooperation, yielding a diagnostic radiograph while minimizing additional radiation.

96. (C) kVp calibration test

A kVp calibration test checks whether the machine is delivering the chosen kilovoltage accurately. This is crucial for achieving consistent penetration and contrast in radiographs. Timer accuracy (A) confirms exposure duration, while mA linearity (B) checks if changes in mA settings reflect proportional changes in beam intensity. Fog tests (D) measure unwanted film exposure from ambient light or processor issues. Accurate kilovoltage ensures reproducible diagnostic quality and prevents retakes. Routine quality control on modern X-ray units upholds reliability, aligning with ALARA objectives for safe and effective radiographic practices in dentistry.

97. (B) Place a lead apron with thyroid collar

During pregnancy, dental radiographs should be taken only when clinically necessary. If a vertical root fracture is suspected, the benefits of a precise diagnosis often outweigh minimal radiation risks. A lead apron and thyroid collar shield both thyroid and abdominal regions, significantly reducing fetal exposure to stray or scatter radiation. Simply postponing all radiographs (D) could delay essential treatment. Panoramic imaging (A) may not reveal the fine detail required, and increasing the distance

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(C) alone doesn't guarantee fetal protection. Correct protective measures and proper collimation align with established guidelines, ensuring the fetus remains safe while obtaining critical diagnostic data.

98. (B) CBCT

Cone Beam Computed Tomography (CBCT) is well-suited for evaluating jaw bone integrity and anatomy prior to radiation therapy. It captures high-resolution 3D data of alveolar bone, potential pathology, and the proximity of vital structures. While occlusal film series (A) or standard cephalometric radiographs (D) offer limited views, they lack comprehensive cross-sectional information. MRI (C) excels in soft tissue but is less effective at detailing the cortical and cancellous bone structure. With the modest dose range of modern CBCT machines, clinicians gain crucial anatomic insights to help anticipate and mitigate complications such as osteoradionecrosis during radiation treatment planning.

99. (B) Full-mouth periapical series

A comprehensive set of periapical radiographs using proper angulation highlights each tooth's root structure and associated bone levels. In advanced periodontitis, accurately visualizing furcations is essential for surgical planning. Vertical bitewings (A) assist with bone loss assessment but might not fully capture furcation involvement, especially in molars. MRI (C) excels in soft tissue imaging but lacks the detail for intricate bony defects around roots. Lateral oblique jaw views (D) are good for broader mandibular assessments. Periapicals offer a precise, localized evaluation, ensuring the periodontist can address furcation defects effectively during surgery.

100. (D) Extraoral bitewing technique

Patients who have undergone head and neck radiation often experience limited mouth opening (trismus) and heightened gag reflexes. An extraoral bitewing technique uses film or sensors placed outside the mouth, capturing interproximal areas to detect cervical caries and assess bone levels. This approach minimizes discomfort associated with intraoral placement. Though panoramic views (C) provide a broad overview, they may miss or distort mild cervical lesions. Full-mouth periapicals (A) or vertical bitewings (B) require more intraoral positioning, which is challenging here. Extraoral bitewings strike an appropriate balance, offering diagnostic detail of posterior regions without exacerbating the patient's discomfort.

101. (B) Attenuation

Attenuation refers to the overall decrease in X-ray beam intensity caused by absorption and scatter within the patient's tissues or other materials. As photons travel through matter, some are absorbed (Photoelectric effect), and others undergo deflection (Compton scatter), collectively reducing the number of photons that reach the detector. The absorption coefficient (A) quantifies a material's specific capacity to absorb photons. Excitation (C) involves raising electrons to higher energy states, and radioactive decay (D) pertains to unstable nuclei spontaneously transforming. Understanding attenuation is vital in predicting image quality and managing patient dose.

102. (B) Spinal cord

The spinal cord is highly radiosensitive because injury can lead to permanent neurological deficits. During head and neck radiotherapy, strict dose limits aim to safeguard the cord's delicate structures, preventing myelopathy. Parotid glands (A) are also important to spare, but dryness or salivary dysfunction (while impactful on quality of life) is less catastrophic than spinal cord injury. Mandibular bone (C) can sustain higher doses before osteoradionecrosis risk elevates. Buccal mucosa (D) tolerates moderate doses, although mucositis can occur. By respecting low threshold doses, radiation oncologists minimize life-altering complications and preserve essential neurologic function.

103. (B) To detect changes in bone metabolism or turnover

Scintigraphy (bone scans) relies on intravenously injected radiotracers like technetium-99m, which accumulate in areas of increased osteoblastic activity or altered metabolism. This technique is helpful for diagnosing conditions such as osteomyelitis, metastatic lesions, or subtle fractures in the jaws, which might be missed on standard radiographs. It does not create high-resolution anatomic images of

sinus walls (A) nor replace all dental imaging (C). Cross-sectional images (D) are more characteristic of CT or CBCT. Because scintigraphy highlights dynamic bone changes, it is valuable in detecting early pathologies involving abnormal bone remodeling or inflammation.

104. (D) Well-defined, corticated unilocular lesions

Osteomyelitis often presents with diffuse, moth-eaten radiolucencies, possibly containing necrotic bone fragments (sequestra). Infection can spread along the marrow spaces, leading to discontinuities in cortical bone and irregular radiographic appearances. Widened periodontal ligament (PDL) spaces may be an early sign of spreading inflammatory changes. By contrast, well-defined, corticated unilocular lesions (D) typically suggest benign, slow-growing entities like cysts rather than a widespread infection. Recognizing suspicious patterns for osteomyelitis is crucial for urgent management, often involving antibiotics and possibly surgical debridement to remove necrotic bone and control the infection's progression.

105. (B) Automatic processing typically maintains optimal temperatures and timing automatically

Automatic film processors incorporate a transport system that moves films through developer, fixer, wash, and dryer stages at tightly controlled temperatures and intervals. This ensures consistency in film density and contrast, reducing human error. Manual processing also uses developer, fixer, rinsing, and drying but relies on an operator to track time and temperature, which can be more variable. It usually requires a darkroom, whereas automatic processing, though more enclosed, often still needs a safe light environment or specific feed-in area to protect unexposed film. Manual processing does not surpass automatic in speed (C), and both systems require chemicals.

106. (B) Proper vertical angulation

Accurate assessment of interproximal bone levels requires the correct vertical angulation of the X-ray beam. If the beam is angled incorrectly, the alveolar crests may appear distorted or elongated, preventing precise measurement of periodontal bone height. High kV (A) primarily affects contrast, while longer exposure time (C) could simply increase density without improving accuracy. Larger sensors (D) expand coverage but do not inherently ensure correct vertical projection. By mastering proper angulation, the dentist can accurately gauge bone loss or regeneration, supporting diagnosis, treatment planning, and monitoring in periodontics.

107. (B) Use a faster exposure time

Motion blur often occurs when the child moves, either due to discomfort or inability to remain still. Using a faster exposure time shortens the interval during which movement can degrade image sharpness. Increasing the object-to-receptor distance (A) can actually exacerbate magnification or blur. A panoramic film (C) may be less detailed for detecting incipient caries and requires the child to remain still for a longer period. The standard source-to-skin distance is around 8 inches or more, not specifically 10 (D). By selecting a higher mA or speed, the operator can effectively reduce exposure time.

108. (B) Raise the temperature or extend time in the developer

When manual processing yields underdeveloped films—evidenced by light, grainy images—it often indicates that the developer solution is too cool or the films were not kept in the developer for a sufficient duration. Correcting the temperature or prolonging development ensures enough chemical interaction for proper contrast and density. Increasing fixing time (A) won't compensate for inadequate development. Using a higher-powered safelight (C) risks fogging the film if not carefully controlled. Shortening drying time (D) has no direct influence on contrast. Proper developer conditions promote consistent, diagnostic-quality images for accurate clinical interpretation.

109. (B) Keeping the film and tooth parallel to each other

In the paralleling technique, the receptor (film or sensor) and the tooth's long axis must remain parallel, with the X-ray beam aimed perpendicular to both. This geometry ensures minimal distortion and more accurate length representation. Angling the beam at 45° (A) or placing the film at a steep angle (C) is typical of the bisecting technique, increasing the risk of foreshortening or elongation. An occlusal orientation (D) is a different type of

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radiograph altogether. By maintaining parallel alignment, the resultant periapical image captures true anatomical proportions, crucial for diagnosing fractures, periapical changes, or root morphology.

110. (B) Store them in proximity to strong disinfectant fumes for sterilization

Dental X-ray films are sensitive to heat, moisture, chemical fumes, and radiation. Proper storage includes maintaining a cool, dry environment, guarding against light exposure, and shielding from scattered X-rays. Storing them near harsh disinfectant fumes can damage the emulsion, causing fogging or artifacts. Sterilizing unexposed film is neither necessary nor recommended. Options (A), (C), and (D) highlight correct precautions: stable temperature, no light leaks, and lead barriers to block stray radiation. Ensuring film integrity before use is crucial for obtaining high-quality diagnostic images during patient examinations.

111. (C) Pediatric patients with developing tissues

Children's rapidly dividing tissues have a higher risk of genetic damage from ionizing radiation, and their longer remaining lifespan increases the window for any latent malignancy to manifest. Older adults (B) generally have fewer cell divisions remaining, reducing overall risk from small exposures. Middle-aged adults (A) without comorbidities are also at a lower relative risk compared to children. Edentulous individuals (D) often require fewer radiographs. Minimizing unnecessary scans in children is critical, following ALARA and strict selection criteria. Child-specific shield use and properly calibrated exposures further protect vulnerable tissues in pediatric dentistry.

112. (A) Overlapping of interproximal contacts

When horizontal angulation is not aligned through the open embrasures, the beam projects two adjacent teeth in a manner that superimposes or overlaps their contacts. This overlap obscures the interproximal regions, making caries detection difficult. Fogged images (B) often result from processing errors or light leaks, while foreshortening (C) is a vertical angulation problem. Cone cuts (D) arise when the primary beam fails to encompass the entire receptor surface. Accurate horizontal angulation through the contact points is vital for diagnosing early proximal caries, ensuring crisp separation between teeth on bitewing radiographs.

113. (D) MRI

MRI is particularly suited for evaluating the extent of soft-tissue lesions, including tumors, due to its superior soft-tissue contrast resolution. In the case of a nonhealing tongue ulcer suspicious for malignancy, MRI can reveal tumor invasion depth and associated lymph node changes. While CT (A) also offers cross-sectional imaging, it is generally better for bone detail and may require contrast enhancement for soft tissues. Panoramic images (B) and occlusal radiographs (C) provide limited insight into deep soft-tissue structures. MRI's excellent differentiation of muscle, fat, and neoplastic tissues aids in staging and treatment planning.

114. (A) Osteosarcoma

A "sunburst" periosteal reaction is classically linked with osteosarcoma, a malignant bone tumor that prompts irregular spicules of bone extending outward from the cortex. Chronic osteomyelitis (B) may produce layered or "onion-skin" periosteal reactions, while a radicular cyst (C) manifests as a well-defined radiolucency at the apex of a nonvital tooth. Ameloblastoma (D) typically shows a multilocular "soap bubble" or "honeycomb" radiolucency. Recognizing a sunburst pattern signals a potentially aggressive lesion, prompting immediate referral for biopsy, advanced imaging, and oncologic consultation to determine optimal treatment.

115. (C) Perform acceptance tests and set exposure protocols according to manufacturer guidelines

Whenever new radiographic equipment is introduced, acceptance testing helps confirm performance consistency with specifications before routine clinical use. Exposure settings should then be tailored to patient size, diagnostic need, and image receptor sensitivity. Bumping the parameters too high (A) raises unnecessary dose. Applying the same adult setting universally (B) ignores pediatric ALARA principles and variability among adults. Testing only on pediatric patients first (D) poses unnecessary risk and does not confirm broader functionality. Proper calibration, staff training, and adherence to manufacturer recommendations

maximize image quality while minimizing dose across patient populations.

116. (B) Using lead aprons and thyroid collars whenever feasible

ALARA (As Low As Reasonably Achievable) calls for implementing every reasonable measure to reduce radiation exposure. Applying lead aprons and thyroid collars effectively shields radiosensitive tissues from scattered radiation. Universal round collimation (A) is less ideal than rectangular collimators, which more tightly confine the primary beam. Removing filtration (C) would increase patient dose of lower-energy photons that only add to tissue absorption. Repeating radiographs unnecessarily (D) raises cumulative exposure without justification. By consistently employing protective gear and verifying exposures are clinically necessary, dental practitioners uphold ALARA and safeguard patients during imaging procedures.

117. (C) An irregular, moth-eaten radiolucency with cortical perforation

An ill-defined, moth-eaten radiolucency that breaches cortical boundaries is highly suggestive of an aggressive process such as carcinoma or sarcoma. A unilocular, well-defined lesion with sclerotic margins (A) often indicates a benign entity like a cyst. Generalized horizontal bone loss (B) may signify chronic periodontal disease, while mixed lesions with calcifications (D) can be benign fibro-osseous lesions or certain tumors, not definitively malignant. Whenever cortical bone appears perforated by a poorly demarcated lesion, urgent further imaging (CBCT, CT) and a biopsy are warranted to establish a definitive diagnosis and plan treatment.

118. (B) Dentigerous cyst

Dentigerous cysts develop around the crown of an unerupted or developing tooth, particularly mandibular third molars or maxillary canines. The radiograph typically reveals a well-defined radiolucency beginning at the cementoenamel junction and enveloping the crown. A periapical abscess (A) arises at a root apex of a nonvital tooth. A Stafne bone defect (C) is usually a lingual depression near the mandibular angle containing salivary gland tissue. Central giant cell granuloma (D) is often multilocular with more aggressive features. Accurate identification of a dentigerous cyst supports endodontic or surgical intervention to prevent complications.

119. (D) A is false, R is true

Rectangular collimators actually lower patient dose by narrowing the X-ray beam to a size closely matching the receptor, reducing unnecessary radiation to adjacent tissues. Consequently, scatter radiation is also decreased, improving image quality. Round collimators permit a wider beam, increasing the probability of unneeded exposure. Therefore, the assertion (A) that rectangular collimators increase dose is incorrect, whereas the reason (R) is correct: limiting beam dimensions decreases scatter and total absorbed dose. This principle aligns with ALARA by prioritizing patient safety. Hence, dentists are encouraged to use rectangular collimation alongside lead aprons and thyroid collars where feasible.

120. (B) Provide appropriate protective measures and maintain safe operating distances

Pregnant staff members can safely continue dental radiographic tasks if they adhere to established radiation safety protocols: wearing lead aprons, using thyroid collars if near the beam, and maintaining recommended distance and positioning (at least 6 feet away, 90–135° from the primary beam). Barring them from all radiographic duties (A) is unwarranted if proper protection is followed. Simply adjusting kV (C) without a comprehensive plan isn't sufficient, and restricting them solely to panoramic imaging (D) overlooks safety in all imaging types. Strict compliance with ALARA ensures minimal exposure risk to both the assistant and fetus.

121. (B) Step wedge test with control film

A step wedge test involves exposing a film through an aluminum step wedge, creating a series of density steps. Comparing the resulting film to a control standard indicates whether developer and fixer solutions maintain their required potency. If the processed film deviates from expected density ranges, the chemicals may need replenishment or temperature adjustment. The coin test (A)

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specifically checks safelight conditions. Collimator alignment (C) ensures the X-ray beam precisely matches the receptor area, while kVp accuracy (D) validates the machine's voltage output. By regularly performing a step wedge test, staff monitor and maintain consistent film-processing quality.

122. (A) Vertical bitewings

Vertical bitewing radiographs extend the view of alveolar bone in patients with deeper periodontal pockets, allowing more accurate detection of vertical or angular bone defects. By orienting the film "vertically" rather than horizontally, clinicians capture a greater extent of the supporting bone around molars and premolars. A panoramic radiograph (B) gives a broad overview but often lacks the detail needed to see subtle vertical defects. Occlusal radiographs (C) focus more on arch width or large pathology. MRI (D) is typically used for soft tissue and is not the primary modality for precise bony defect assessments.

123. (C) Radionuclide bone scan

A radionuclide bone scan (scintigraphy) can pinpoint areas of altered bone metabolism, allowing detection of necrotic or nonviable bone segments characteristic of osteoradionecrosis. CBCT (A) provides detailed cross-sectional anatomy but may not reveal subtle metabolic inactivity. Sialography (B) is specific to salivary duct systems, and ultrasound (D) is less informative for cortical bone assessment. Bone scans use radiotracers like technetium-99m, highlighting discrepancies in osteoblastic activity. If suspicion of osteoradionecrosis persists, combining bone scan findings with clinical and other imaging data guides management, possibly including surgical debridement or hyperbaric oxygen therapy to promote healing.

124. (B) Vertical bitewings

When panoramic images fail to reveal precise bone levels in advanced periodontal disease, vertical bitewing radiographs are often the next step. They capture a more extended view of alveolar bone around posterior teeth, detailing vertical and horizontal defects beyond the range of conventional horizontal bitewings. A lateral cephalogram (C) is primarily used for orthodontic measurements or profiling, and MRI (D) is excellent for soft tissue but not standard for alveolar bone assessment. Accurate detection of vertical bone loss guides specific periodontal therapies, ensuring targeted interventions for patients with severe disease or complicating conditions.

125. (D) CBCT

Cone Beam Computed Tomography (CBCT) offers detailed three-dimensional imaging of the maxillofacial region while generally using lower radiation doses than conventional medical CT. It reveals alveolar bone thickness, sinus floor integrity, and any potential oroantral communication with spatial accuracy. Although MRI (A) excels in soft tissue, it provides limited detail on bony structures and is less common for strictly osseous defects. A Water's view (C) demonstrates sinus anatomy but lacks cross-sectional precision. Medical-grade CT (B) can provide comparable 3D data yet often involves higher dose. CBCT thus strikes an optimal balance of clarity and radiation safety.

126. (B) Energy deposited by radiation per unit mass in tissue

Absorbed dose, expressed in grays (Gy), is defined as the amount of energy deposited by ionizing radiation per kilogram of tissue. It is a physical measurement reflecting how much energy is transferred to that tissue. Ionization in air (A) corresponds to exposure, measured in coulombs per kilogram. Cancer probability (C) aligns more closely with equivalent or effective dose in sieverts (Sv), factoring in tissue sensitivities. Biological effectiveness (D) depends on radiation type and the specific tissue's radiosensitivity. Understanding absorbed dose guides how much energy patient tissues receive during diagnostic or therapeutic radiographic procedures.

127. (B) Thermoluminescent dosimeter (TLD)

Thermoluminescent dosimeters (TLDs) employ materials—commonly lithium fluoride—that store energy when exposed to ionizing radiation. Heating these crystals later causes them to emit light proportional to the absorbed dose. Film badges (A) rely on radiographic film, while OSL badges (C) use stimulated luminescent detection via a light source. Digital electronic dosimeters (D) measure dose in real time, typically using semiconductor detectors.

TLDs are favored in many clinical settings for their reusability, sensitivity, and accurate dose reporting over a set monitoring interval. Consistent dosimetry assures staff remain within permissible exposure limits, following radiation safety guidelines.

128. (C) Scatter increases the radiation dose to tissues beyond the area of interest

Scatter radiation is caused by interactions (like Compton scatter) in the patient's tissues, deflecting photons away from the primary beam path. This lateral radiation can expose surrounding tissues not intended for examination, elevating the overall dose and potentially degrading image quality with fogging. It is not helpful for generating contrast (A) nor does it improve beam penetration (B). While rectangular collimation (D) reduces scatter by narrowing the beam, it cannot eliminate it entirely. Recognizing that scatter raises dose outside the focal area drives the use of shielding, proper collimation, and protective barriers in dental radiographic practice.

129. (D) Instructing the patient to move their jaw slightly to prevent muscle stiffness

Motion blur in panoramic images occurs if the patient shifts position during the exposure arc. Ensuring the patient's chin is properly positioned (A), reminding them to remain absolutely still (B), and employing rigid head positioners (C) all help maintain stability. Instructing the patient to move the jaw (D) introduces unwanted motion, creating blurred areas in the final radiograph. Patients must be informed about the duration of the exposure and cautioned against swallowing or changing head or jaw positions. Minimizing motion artifacts preserves diagnostic detail for evaluating dental arches, temporomandibular joints, and related structures.

130. (C) CCD/CMOS sensors provide an immediate on-screen image, while PSP plates must be scanned

Direct digital sensors (CCD/CMOS) transmit signals electronically to the computer as soon as the X-ray exposure is complete, creating an instant digital image. Photostimulable phosphor (PSP) plates store the latent image and require subsequent scanning in a specialized reader. PSP plates also degrade over multiple uses if damaged, albeit they are typically reusable many times. They can be thinner and more flexible than direct sensors, often enhancing patient comfort. The main distinction is immediate image availability with CCD/CMOS (direct) versus the two-step capture-and-scan method of PSP (indirect) digital imaging systems.

131. (B) Panoramic radiograph

A panoramic radiograph provides a broad overview of the entire mandible, maxilla, and dentition, helping identify possible fractures, displaced teeth, or other traumatic injuries in a single image. While CBCT (C) can yield more detail, it confers a higher dose and may require a compliant patient who can stay motionless. Bitewings (A) primarily capture interproximal surfaces for caries and bone levels, not extensive trauma. Occlusal radiographs (D) show a limited region. In many pediatric trauma cases, the panoramic film is sufficient for initial assessment, prompting more advanced imaging if necessary after clinical evaluation.

132. (C) The SLOB rule (Same Lingual, Opposite Buccal)

The SLOB rule stands for "Same Lingual, Opposite Buccal." When comparing two radiographs taken from slightly different horizontal angles, if the object of interest (the supernumerary tooth) moves in the same direction as the X-ray tube shift, it is located lingually/palatally. If it moves opposite to the tube shift, it lies buccally. This principle is an application of parallax (B) in dental radiography, sometimes referred to as Clark's rule. Neither infiltration (A) nor an "angulation inversion rule" (D) is recognized terminology for localization. SLOB helps pinpoint the spatial relationship of additional or impacted teeth.

133. (B) Clean and replenish processing solutions, ensuring the work area is tidy

Dark spots, stains, or other artifacts often stem from contaminated solutions, developer splashes, or poor darkroom hygiene. The first response is to ensure the developer and fixer are fresh, at correct temperatures, and free from cross-contamination. Wiping down countertops and removing any residual chemical spills also helps. Completely discarding the unit (A) is premature unless it is truly nonfunctional. Switching to digital (C) is a different

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workflow and not necessarily the immediate solution. Accepting artifacts (D) could compromise diagnosis. Proper maintenance typically restores artifact-free processing, preserving the diagnostic utility of film-based radiography.

134. (D) Place the film with its white side facing the maxillary arch

In maxillary occlusal radiography, the film or phosphor plate is placed flat against the occlusal surfaces, with its white (exposure) side oriented toward the arch of interest. The X-ray beam is typically angled from above the bridge of the nose, often around 65° to 75° relative to the film plane, depending on the projection desired. The mid-sagittal plane's position (A) helps keep the head upright, but it is not the main action. Angling the beam at 90° (B) might be for certain occlusal views of the mandible. Directing the beam from below the chin (C) would capture mandibular occlusals.

135. (C) Encouraging the patient to tilt the head back to enhance soft tissue profile

For a lateral cephalometric radiograph, the patient's head must be oriented so the Frankfort plane is parallel to the floor and the midsagittal plane is perpendicular to the film. All metal objects (like earrings or hair accessories) should be removed to avoid artifacts. Tilting the head back (C) distorts the natural head posture, altering the true horizontal and vertical relationships important for cephalometric analysis. Proper positioning ensures accurate measurements of skeletal and soft tissue landmarks, aiding orthodontic diagnosis and treatment planning. Maintaining a neutral head orientation is essential for reproducible, valid cephalometric data.

136. (C) An elderly patient undergoing radiation therapy for oral cancer

Osteoradionecrosis (ORN) often occurs in irradiated bone with compromised blood supply. Patients receiving significant radiation doses to the jaw, such as those treated for oral or oropharyngeal cancers, face a notable risk, especially if traumatic dental extractions are performed in high-dose regions. Children with antibiotic prophylaxis (A) lack the radiation factor. A single panoramic X-ray (B) involves minimal dose and negligible risk for ORN. A young adult without any radiation history (D) similarly faces no risk of radiation-related bone necrosis. Strict preventive measures and preradiation dental evaluations help reduce ORN incidence.

137. (B) Reduced magnification and improved sharpness

When the X-ray source is placed farther from the tooth (object), the divergent rays strike the film more parallel, lowering magnification and improving image clarity. If the source is too close, the image often appears magnified and blurred due to the geometry of divergent beams. Darkness (C) is influenced by exposure parameters (mA, kV, and time), not merely distance. Scatter levels (D) are more related to collimation, beam energy, and patient size. Proper source-to-object distance is a fundamental geometric principle ensuring minimal distortion and a sharper depiction of tooth anatomy on the final radiograph.

138. (C) Reverse Towne's view

The Reverse Towne's projection is particularly suited for examining the condyle and coronoid process by positioning the patient with mouth open and forehead touching the film cassette while angling the beam from behind. This orientation highlights the ramus and coronoid region, which may be challenging to visualize on panoramic or periapical views. A lateral cephalogram (A) is more oriented for orthodontic profiling. The submentovertex (B) is helpful for zygomatic arches and skull base, while an occlusal view (D) is limited to alveolar or palatal perspectives. Reverse Towne's reveals fracture lines otherwise obscured in standard projections.

139. (D) Stafne bone defects

Stafne bone defects (also known as Stafne cysts or lingual mandibular bone depressions) appear as round or ovoid radiolucencies below the mandibular canal in the posterior region. They represent a developmental lingual depression often occupied by salivary gland tissue, not a true cyst or pathology. Sialoliths (A) form within salivary ducts, typically near the submandibular gland, but appear differently in radiographic alignment. Antroliths (B) occur within the maxillary sinus, and tonsilloliths (C) are calcifications in tonsillar crypts. Recognizing Stafne defects prevents unnecessary interventions,

as they rarely cause clinical symptoms and remain stable over time.

140. (C) Check developer solution concentration and temperature

When radiographs become consistently darker than expected, the simplest initial check is the developer solution. Overly high temperature or a too-potent developer leads to overdevelopment and excessive film density. If the chemical and temperature parameters are normal, the operator might then confirm the unit's output or consider adjusting exposure factors. Replacing the tube head (B) is a major step, only after ruling out simpler issues. Simply reducing exposure time (A) or increasing distance (D) might temporarily lighten images but doesn't resolve an underlying processing or calibration discrepancy. Correct chemical management is the most straightforward, immediate step.

141. (B) Lead aprons are always used to shield the torso and gonads, with a thyroid collar recommended when possible

Current guidelines advocate using lead aprons consistently in dental radiography, especially for children, pregnant patients, or whenever feasible, to protect radiosensitive tissues like gonads and the abdominal region. Although the thyroid collar is not always practical (such as with certain panoramic exams), it's strongly recommended for intraoral procedures if it doesn't interfere. Stating that aprons are required only for pregnant patients (A) is too restrictive, while rectangular collimation (C) reduces but does not eliminate the need for shielding. Using digital sensors (D) does not negate protective measures. Consistent shielding complements ALARA and fosters patient safety.

142. (B) Paget's disease

In the jaws, Paget's disease of bone may exhibit a "ground-glass" or "orange-peel" radiographic texture due to abnormal bone remodeling. As the disease progresses, the mixed radiopaque-radiolucent appearance can evolve into more patchy, cotton wool–like areas, especially in later stages. Ameloblastoma (A) typically shows multilocular radiolucencies, while periapical cemento-osseous dysplasia (C) presents with early radiolucencies that become increasingly radiopaque over time, usually near tooth apices. Odontomas (D) contain dental tissues in disorganized or toothlike forms. Recognizing the characteristic ground-glass pattern helps prompt further evaluation of systemic involvement in Paget's disease.

143. (B) A narrow, obliterated pulp chamber with little visible canal space

Pulp canal calcification occurs when secondary or tertiary dentin forms in response to trauma or irritation, gradually obliterating the pulp space. Radiographically, the pulp chamber and canal appear significantly reduced, sometimes virtually absent. A periapical radiolucency (A) could indicate necrosis or periapical pathology, not necessarily calcification. A sclerotic border (C) often outlines a radicular cyst or granuloma. A radiopaque line across the pulp (D) might suggest a pulp stone, but complete narrowing of the canal is more indicative of diffuse pulp canal calcification. Accurate interpretation guides endodontic treatment decisions and prognosis.

144. (A) Both A and R are true, and R is the correct explanation of A

Raising the kilovoltage (kVp) accelerates electrons to higher energies, resulting in a more penetrating X-ray beam. Tissues of different densities are penetrated more uniformly, yielding a broad spectrum of intermediate gray shades rather than stark blacks and whites. This increased latitude lowers the overall contrast, as the difference between dense and less dense areas appears subtler. The reason statement (R) correctly explains how stronger photon penetration leads to more uniform densities on the image, in turn reducing contrast (A). Consequently, both statements are true, and (R) accurately justifies (A), aligning with fundamental radiographic principles.

145. (B) Check the fixer solution for depletion or contamination

A brownish tint on radiographs indicates that residual silver halides weren't fully removed, often due to exhausted or improperly functioning fixer. Verifying and replenishing the fixer solution typically resolves the problem. Raising the temperature (A) might worsen chemical exhaustion

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by accelerating reactions without replenishment. Rinsing for a shorter time (C) can exacerbate the issue, leaving more unremoved silver halides. Switching to manual processing (D) is not necessary if the automatic processor is otherwise functioning well. Maintaining fixer strength and ensuring adequate film circulation within the fixer are key to producing clean, archival-quality radiographs.

146. (A) Digital Subtraction Radiography

Digital Subtraction Radiography (DSR) relies on high-quality, standardized baseline and follow-up images. Subtraction software aligns and mathematically subtracts pixel intensities, making minor bone density changes or pathological developments more visible. Conventional tomography (B) involves slice imaging of structures by blurring out areas above and below the focal plane, unrelated to subtracting two images. MRI with contrast (C) reveals vascular or soft tissue enhancement but does not produce direct subtraction of consecutive dental radiographs. Panoramic layering (D) is an artifact that sometimes appears in panoramic exposures, not a technique for comparing changes over time.

147. (C) Vertical bitewing

Vertical bitewings capture a longer segment of the alveolar bone in comparison to conventional horizontal bitewings, making them ideal for evaluating advanced periodontal conditions with significant vertical or horizontal bone loss. Panoramic films (A) provide a broad overview but often lack the fine detail needed for accurate measurement of interproximal bone levels. A lateral cephalogram (D) displays skeletal relationships, not localized posterior defects. By extending the coverage vertically, vertical bitewings ensure the dentist can detect deeper subgingival calculus and bone loss, guiding appropriate periodontal or surgical intervention for comprehensive management.

148. (C) CBCT

Cone Beam Computed Tomography (CBCT) offers a localized 3D view of the mandible at a dose typically lower than that of a conventional medical CT. It's particularly helpful for assessing complex lesions and clarifying boundaries of infected or necrotic bone in suspected osteomyelitis or chronic periapical pathology. MRI (B) provides excellent soft-tissue resolution but may not fully characterize bony sequestra or cortical perforations. Extraoral bitewings (D) limit detail to interproximal areas and lack cross-sectional data. CBCT's high-resolution volumetric slices guide surgical debridement or endodontic therapy by precisely mapping the lesion's location and extent.

149. (A) Sialography

Sialography, performed by injecting a radiopaque contrast agent into the salivary duct, remains the gold standard for visualizing the ductal architecture, diagnosing obstructions, and detecting sialoliths. CBCT (B) is excellent for bony detail but less specific for duct lumens unless large calcifications are present. A lateral oblique jaw view (C) can show salivary gland regions but lacks direct ductal delineation. Digital subtraction radiography (D) is typically reserved for detecting small changes in bone density or lesions over time. Sialography's targeted approach yields detailed images of submandibular or parotid duct structures.

150. (B) CBCT

Cone Beam Computed Tomography (CBCT) offers detailed, three-dimensional views of bone integrity, making it invaluable for assessing osteoradionecrosis or advanced infection in previously irradiated jaws. MRI (C) excels at soft-tissue detail but may not characterize cortical bone destruction or sequestra as clearly, and gadolinium contrast is not routine for dental offices. Mandibular occlusal radiographs (D) provide a limited two-dimensional view, whereas specialized panoramic filters (A) still yield a 2D image. CBCT's localized imaging and relatively moderate radiation dose allow meticulous mapping of necrotic segments or infection, guiding potential surgical debridement or further interventions in a practical clinical setting.

151. (C) A summation of absorbed dose in all radiosensitive tissues, weighted by their relative sensitivities

Effective dose is a dose-protection concept designed to gauge the overall potential harm from radiation exposure. It factors in the type of radiation (e.g., X-rays vs. alpha particles) and the

varying sensitivities of different tissues, assigning higher weighting to more radiosensitive organs. By combining absorbed dose with these weighting factors, effective dose approximates the risk of stochastic effects such as carcinogenesis. It is not a fixed regulatory value (D), nor is it merely the total absorbed dose (A) without weighting. Recognizing effective dose enables clinicians to compare and limit risks across diverse diagnostic or therapeutic exposures.

152. (B) Standing at least 6 feet away and behind a protective barrier

Operators who consistently perform radiographic procedures risk scatter and secondary radiation exposure. To comply with the ALARA principle, they should maintain distance (at least six feet) and use structural shielding like a lead-lined wall or mobile barrier. Holding the film (A) directly exposes hands to primary or scatter beams. Reducing mA (C) below recommended levels can result in underexposed images requiring retakes, ultimately increasing cumulative dose. Lead gloves (D) protect hands but leave the rest of the operator's body vulnerable. Proper distance plus a protective barrier is the most widely endorsed safety measure.

153. (B) Higher energy photons penetrate tissues more uniformly

Raising kV accelerates electrons to higher energies, producing X-ray photons that more evenly penetrate anatomical structures of different densities. This leads to a broader gray scale, effectively lowering image contrast because the distinction between less-dense and more-dense tissues is minimized. It does not diminish the number of photons (A), nor does it specifically create white lines (C). Film emulsion (D) is unaffected by kV in the sense of "hardening." Instead, tissues of varying thickness absorb similar fractions of the beam at high kV, resulting in decreased contrast but greater image latitude.

154. (C) Frequently reformatting the system's hard drive to store more images

Maintaining consistent digital image quality revolves around proper sensor calibration, timely erasure of photostimulable phosphor (PSP) plates, and verifying that display monitors retain consistent brightness and contrast. Periodic sensor checks prevent drifting sensitivity, while background erasure avoids residual ghost images. Reformatting a hard drive (C) simply erases data and requires fresh software installation, providing no direct benefit to image consistency. It can actually increase downtime or risk data loss if not performed correctly. Quality assurance in digital radiography focuses on correct sensor usage, controlled scanning procedures, and stable hardware and software environments for reliable results.

155. (B) CT uses rotational X-ray beams and computer processing, whereas conventional tomography relies on synchronized tube-film movements

Conventional tomography (sometimes called "planar tomography") uses a mechanical motion of the X-ray tube and receptor around a pivot point. This movement blurs structures above and below the focal plane, yielding a sharp image slice of the targeted layer. Computed tomography, by contrast, collects multiple rotational exposures around the patient and processes them digitally to form cross-sectional or volumetric images. It can render three-dimensional reconstructions with better detail of both bone and soft tissues. Neither method requires intravenous contrast by default (D). Conventional tomography does not provide the same advanced, computer-aided multiplanar reconstructions available from CT.

156. (B) Employing distraction techniques and child-friendly explanations

Children with a sensitive gag reflex are more likely to move or reject sensor placement. Simple, age-appropriate communication and fun distraction strategies help them relax, tolerate the sensor, and stay still. Although panoramic (A) can be an alternative in some cases, it may not always provide the necessary detail for small lesions or specific periapical views. Merely increasing exposure time (C) often risks overexposure and does not address gagging. Cold air (D) may be uncomfortable. A calm environment and a gentle explanation, potentially combined with quick sensor placement, effectively reduce motion and retakes.

157. (B) Ensure the processing hangers and racks are free of static electricity

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Static electricity discharges can create thin, branching black lines or spots on film radiographs. Friction from improper handling or removing films from the hanger in dry conditions often triggers these sparks. Thoroughly grounding metal hangers and racks prevents electrostatic buildup. Stirring the fixer (A) has no direct impact on static lines, and reversing developer and fixer steps (C) ruins films. Warmer developer temperatures (D) improve chemical activity but do not solve static discharge. By implementing antistatic precautions (e.g., humidifying the darkroom, grounding equipment), the dentist can eliminate unwanted black artifacts on final radiographs.

158. (B) Discontinue using the sensor and have it inspected for defects

"Hot spots" on a digital sensor that recur consistently in the same location suggest a damaged or malfunctioning sensor element (like a dead or stuck pixel cluster) rather than an exposure setting issue. Adjusting kV (A) or distance (C) might alter overall image density but will not correct a localized defect. Display manipulation (D) also fails to eliminate the sensor hardware fault. Discontinuing the sensor's clinical use and having it evaluated by the manufacturer or a certified repair service is the best action. Prompt inspection ensures reliable diagnostic images while preventing repeated suboptimal radiographs.

159. (C) Snugly wrapped around the neck, shielding the thyroid without impeding the X-ray beam

A proper thyroid collar should surround the anterior and lateral aspects of the patient's neck, protecting the thyroid gland from scatter radiation while ensuring it does not obstruct the path of the primary beam to the film or sensor. Placement below the clavicles (A) misses the thyroid region altogether. Keeping it loose (B) reduces its protective function. Positioning it only behind the neck (D) similarly fails to safeguard the gland. Because the thyroid gland is among the more radiosensitive tissues, correct collar usage—snugly but comfortably—upholds the ALARA principle, particularly for pediatric patients and those requiring frequent exposures.

160. (C) Positioning the occlusal plane severely upward so the sinuses are entirely in the beam

For a maxillary CBCT, the occlusal plane should align comfortably within the unit's field of view; an extreme upward tilt can distort anatomy, compromise image clarity, or unnecessarily expose regions beyond the area of interest. Removing all metallic objects (A) prevents scattering artifacts. Stabilizing the head (B) curbs motion blur, and instructing the patient to remain still (D) is essential for crisp 3D reconstructions. Although visualizing the sinuses is often relevant, severe head extension is not standard. Proper alignment ensures balanced coverage of the maxilla without imposing excessive positioning strain on the patient.

161. (C) Younger females, especially pediatric age

Children and adolescents are more susceptible to radiation-induced thyroid damage due to higher cell turnover and longer expected lifespans, thereby increasing the latent period for potential malignancies. Younger females in particular face slightly increased thyroid cancer susceptibility. Postmenopausal women (A) or older adults (D) typically have less residual time for radiation effects to manifest. Smoking status in men (B) can increase certain cancer risks but doesn't primarily heighten thyroid damage susceptibility from dental exposures. Consequently, thorough use of thyroid collars and minimal imaging protocols for pediatric and young female patients is strongly recommended.

162. (B) Foreshortening of the tooth on the radiograph

When the X-ray beam is angled too steeply while using the bisecting angle technique, the image of the tooth appears shortened or "foreshortened." The central ray crosses the tooth and the film at a high angle, effectively compressing the tooth's length on the final image. Elongation (A) occurs with insufficient vertical angulation, while overlapping (C) arises from horizontal angulation errors. Cone cuts (D) result from incorrect alignment of the PID with the sensor, not from vertical angulation issues. Mastering correct angulation is fundamental to ensuring accurate geometry in periapical radiographs.

163. (C) CBCT

Cone Beam Computed Tomography (CBCT) excels at showing 3D details of tooth anatomy, root canal configurations, and periapical pathologies that might

go undetected on conventional 2D radiographs. Accessory canals, untreated canals, or small lesions can be visualized in multiple planes (axial, sagittal, coronal). Panoramic (A) is insufficient for precise endodontic assessment, and occlusal views (D) mainly capture broader arch aspects. MRI (B) can demonstrate soft tissue and fluid but typically lacks the fine bony detail required to identify small canals or localized periapical lesions. Consequently, CBCT is often the imaging modality of choice for complex post-treatment evaluations.

164. (C) Stafne bone defect (static bone cavity)

A Stafne bone defect typically appears below the mandibular canal near the angle or submandibular region, manifesting as a well-defined radiolucency (often described as a defect or cavity) with possible cortication. Despite being referred to as a "defect," it is a developmental lingual concavity that commonly holds salivary gland tissue. Odontomas (A) form above the canal within the alveolar ridge. Sialoliths (B) are typically located along the path of Wharton's duct or inside glandular tissue, not as a corticated bony lesion. Osteomyelitis (D) usually shows an irregular, moth-eaten appearance, not a neat radiopaque or radiolucent ring.

165. (B) Replace and recalibrate the personal dosimeter

If staff technique and protective barriers appear correct, the next logical step is to confirm the accuracy of the badge itself. Dosimeters can malfunction or be mishandled (e.g., left near a radiation source inadvertently). Replacing the dosimeter and recalibrating ensures reliable data going forward. Ceasing all radiographs (A) is impractical if safe practices exist, while lead gloves (C) do not address overall body exposure. Increasing the daily number of radiographs (D) is counterintuitive to reducing dose. Verifying dosimeter function clarifies if the reading was a genuine overexposure or a device artifact.

166. (B) Using proper selection criteria and shielding to adhere to ALARA

The ICRP's foundational principle is As Low As Reasonably Achievable (ALARA), emphasizing justification (imaging only when necessary), optimization (lowest dose consistent with diagnostic requirements), and dose limitation (within regulatory standards). Pediatric patients benefit significantly from careful selection criteria and shielding—though not a complete elimination of X-rays (A). Routine CT scans (C) are unwarranted for all orthodontic cases. Panoramic radiographs (D) alone can be insufficient for intricate root canal details. By advocating appropriate filtering, collimation, and protective measures such as lead aprons or thyroid collars, ICRP guidelines ensure necessary diagnostics while minimizing patient exposure worldwide.

167. (C) A mixed radiolucent-radiopaque lesion with ill-defined borders and bone destruction

Aggressive or malignant lesions in the maxilla often appear as poorly marginated mixed lesions, combining areas of bone lysis (radiolucency) with abnormal sclerotic patches (radiopacity), and possibly showing cortical destruction. This lack of clarity in lesion boundaries raises red flags for malignancy or invasive pathology, necessitating rapid referral for advanced imaging and biopsy. A unilocular radiolucency with an impacted tooth (A) might suggest a dentigerous cyst or other benign entity, while a well-defined cystic area near a vital tooth (B) could be developmental or benign. A radiopaque apex (D) may represent a sclerotic reaction or healing apical scar.

168. (C) Diffuse increased radiopacity with a surrounding radiolucent halo

Chronic sclerosing osteomyelitis can manifest as an area of diffuse, irregular radiopacity in the mandible. Over time, an inflammatory stimulus leads to new bone formation, producing a sclerotic or dense appearance. Occasionally, a radiolucent boundary may be visible between the newly formed bone and healthy cortical bone, reflecting a zone of granulation or reactive tissue. Moth-eaten lucencies (A) and sunray patterns (B) are more indicative of malignancy (e.g., osteosarcoma). A multilocular "soap bubble" (D) typically aligns with certain odontogenic tumors such as ameloblastoma. Recognizing sclerotic changes guides proper diagnosis and long-term management.

169. (C) A is false, R is true

Panoramic radiographs do not typically match the fine detail of bitewings when detecting early

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interproximal caries. Their geometry, with a rotating X-ray source and curved focal trough, produces lower resolution and can distort small lesions. In contrast, bitewings provide close, high-detail visualization of proximal surfaces, crucial for diagnosing incipient caries. Hence, the assertion (A) that panoramic imaging provides equal detail is incorrect. However, the reason (R) is true because the curved receptor and rotational beam of panoramic systems inherently limit spatial resolution. Consequently, bitewings remain the preferred method for thorough interproximal caries evaluation.

170. (B) Collect and dispose of lead foils as regulated hazardous waste

Lead foil is classified as hazardous material and must be handled according to local regulations, often requiring separate recycling or disposal protocols. By collecting and disposing of these foils in compliance with hazardous waste guidelines, the dental office prevents lead contamination of the environment. Burning the foil (A) can release harmful fumes, while flushing it down the sink (C) pollutes water sources. Ceasing lead foil usage (D) may not be feasible if the practice relies on film-based radiography. Instead, following an approved lead recycling or disposal process ensures safe, responsible environmental stewardship.

171. (A) Collimator congruence test

The collimator congruence test ensures that the primary beam's field matches the area of the receptor. Improper alignment can cause cone cuts, where part of the image is unexposed due to the beam missing the film or sensor. The timer accuracy test (B) verifies exposure duration, whereas mA linearity (C) checks if changes in mA produce proportional output changes. Darkroom safelight coin tests (D) detect film fogging from insufficiently safe lighting. Maintaining precise beam alignment avoids retakes, preserving diagnostic clarity while adhering to ALARA by minimizing additional exposures for patients.

172. (C) CBCT

Cone Beam Computed Tomography (CBCT) provides three-dimensional detail of bone surfaces and cortical plates, allowing accurate evaluation for necrosis or pathological defects in regions like the anterior mandible. Limited mouth opening often complicates intraoral film placement, making occlusal radiographs (A) or conventional periapicals less feasible. MRI (B) delineates soft tissue and marrow changes well but may not clearly define cortical plate disruptions. Extraoral bitewings (D) focus primarily on interproximal contact areas. Consequently, CBCT's multiplanar reconstructions clarify both the extent of possible osteoradionecrosis and the status of surrounding anatomy, guiding further management or surgical planning.

173. (C) Nuclear medicine bone scan

A radionuclide bone scan (scintigraphy) detects metabolic changes in bone, pinpointing areas of necrosis or sequestrum formation that might not be fully visible on conventional radiographs or even CBCT. In post-radiotherapy patients, osteoradionecrosis can present with subtle or scattered involvement, and a bone scan highlights reduced uptake (nonviable tissue) or increased uptake around active inflammation. MRI (A) can be helpful, but it's more focused on soft tissue and marrow changes. CBCT (B) shows detailed anatomy but not necessarily viability or metabolic activity. A lateral oblique jaw (D) is limited in diagnosing early or scattered necrosis.

174. (B) Extraoral bitewing

Extraoral bitewing techniques are particularly helpful when intraoral films cause discomfort or cannot be positioned adequately—such as patients with reduced mouth opening post-radiation. This method positions the receptor on the outside of the cheek, capturing interproximal and cervical regions prone to caries. Vertical bitewings (A) remain intraoral and can still pose difficulties in trismus cases, while a lateral cephalogram (C) mostly serves orthodontic or skeletal evaluations. A maxillary occlusal view (D) focuses on arch form rather than interproximal carious areas. Hence, extraoral bitewings allow better access and diagnostic clarity for cervical lesions.

175. (C) CBCT

Cone Beam Computed Tomography (CBCT) is widely adopted in dental practices for 3D

visualization of jawbone structures, including graft sites and potential lesions. It generally operates at lower radiation doses compared to a hospital-based conventional CT scan (B), while still rendering high-resolution images necessary to plan biopsies or surgeries. MRI (A) is excellent for soft tissue and tumor infiltration but may not be as readily available in typical dental settings. A tomographic panoramic series (D) is still essentially 2D-based, with limited slices. CBCT offers multiplanar reconstruction, helping to evaluate bone graft integrity and potential recurrence comprehensively.

176. (C) The filter thickness that reduces the X-ray beam's intensity by 50%

The half-value layer (HVL) quantifies beam quality by indicating how thick a particular material (often aluminum) must be to cut the beam's original intensity in half. A higher HVL corresponds to a more penetrating X-ray beam. Dental X-ray regulations often specify minimum HVLs to ensure low-energy photons (which increase patient dose without improving image quality) are filtered out. HVL does not define scattered photon absorption alone (A), nor does it relate to time-based tube output decay (B). Distance from the source (D) affects intensity, but the HVL specifically describes filtration thickness for halving beam intensity.

177. (A) High-speed electrons decelerating near tungsten nuclei

In a dental X-ray tube, electrons released from a heated tungsten filament (cathode) accelerate toward the tungsten anode. As these high-speed electrons interact with the target's atomic nuclei, they lose kinetic energy and emit bremsstrahlung ("braking radiation") X-rays. This process accounts for most of the broad spectrum of X-ray photons produced. Protons (B) and neutrons (C) are not involved in routine dental X-ray generation, while positrons (D) occur in certain nuclear reactions or PET scans, not typical diagnostic dental machines. Understanding bremsstrahlung provides insight into how beam quality and intensity are modulated by tube potential (kV).

178. (B) Higher kV increases photon energy, enabling deeper tissue penetration

Kilovoltage (kV) determines the accelerating potential for electrons moving from the cathode to the anode, controlling photon energy in the resulting X-ray beam. Higher-energy photons penetrate tissues more effectively, influencing image contrast. Milliamperage (mA) regulates the quantity (intensity) of X-ray photons but has less effect on how deeply those photons penetrate. Although increasing mA produces more photons, their average energy remains the same, so overall beam penetration is primarily determined by kV. Understanding this difference aids in balancing exposure settings to achieve suitable contrast (via kV) and adequate density (via mA).

179. (C) Localized sclerotic rim surrounding a radiolucent lesion

Malignant lesions in the jaws often present as moth-eaten or irregular radiolucencies (A), with poorly defined, ragged margins (B). Many also show cortical bone destruction or perforation (D), possibly invading adjacent soft tissue. By contrast, a distinct sclerotic rim around a radiolucency (C) is more characteristic of benign lesions or cysts, reflecting a host response that walls off slower-growing pathology. Malignant lesions typically lack such neat demarcation, rapidly infiltrating the bone. Recognizing suspicious radiographic signs necessitates advanced imaging and biopsy to rule out malignancy and guide urgent treatment.

180. (C) Compton scatter results in a scattered photon with reduced energy, whereas the photoelectric effect fully absorbs the photon

In dental radiography, Compton scatter arises when an incoming photon ejects an outer-shell electron and continues traveling with diminished energy and altered direction. This scattered photon can degrade image quality by contributing to fog. By contrast, the photoelectric effect entails the complete absorption of a photon by an inner-shell electron, which is ejected from the atom. This complete absorption contributes to the contrast in the radiograph since fewer photons exit dense structures. Both phenomena involve ionization (A), and the photoelectric effect is more likely at lower photon energies (opposite of B). They are distinct, not the same process (D).

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181. (C) Any personnel who could potentially receive occupational exposure

Occupationally exposed individuals—those who, through their professional duties, risk receiving a measurable radiation dose—must wear dosimeters to track cumulative exposure over time. Even if staff use protective barriers (B), consistent monitoring is recommended in high-volume practices. Anyone not performing or assisting with radiography (A) likely does not need a badge. Restricting dosimeter usage to panoramic operators only (D) overlooks intraoral or other radiographic procedures that yield scatter. By wearing dosimeters, the practice can verify compliance with dose limits, ensuring safety and documentation of staff exposure per regulatory guidelines.

182. (A) Decrease vertical angulation

Elongation in the paralleling technique often occurs if the central ray is insufficiently angled relative to the tooth and receptor's long axis. Reducing the vertical angulation (making it slightly more perpendicular to the film) helps prevent the tooth's image from being stretched out. Horizontal angulation (B) controls overlapping contacts, not tooth length errors. Shifting to a larger sensor (C) has no direct effect on elongation. Likewise, moving the film closer to the tooth (D) might disrupt parallelism if the mouth anatomy doesn't accommodate it. Correct vertical angulation is key to avoiding elongated images.

183. (C) Stop using that sensor and contact the manufacturer for repair or replacement

Dead pixels typically manifest as lines or clusters of missing data, compromising image quality and risking misdiagnosis. Increasing exposure (A) does not fix the hardware issue and may raise patient dose unnecessarily. Disabling calibration (B) can worsen the artifact, as calibration helps correct minor sensor variations. Reformatting the computer system (D) rarely addresses hardware defects. Promptly discontinuing the problematic sensor and notifying the manufacturer (or authorized service) is crucial. This ensures that patients receive reliable imaging, preserving diagnostic confidence while preventing repeated exposures from attempts to mask or ignore the sensor's underlying malfunction.

184. (C) Conduct a safelight coin test

Ensuring a light-tight darkroom with an adequate safelight is essential for film-based radiography. The safelight coin test involves placing a coin on unexposed film under normal darkroom conditions for a set time before processing. If the film exhibits an outline of the coin, light contamination or an overbright safelight is present. A brief flashlight test (A) can reveal gross leaks, but it's not a subtle check. Fixer temperature (B) influences final clearing but doesn't assess lighting. Stirring chemicals (D) might maintain solution consistency, yet it doesn't guarantee the darkroom environment is free from film fogging.

185. (B) Recommending a new panoramic for every routine 6-month recall

Radiographic intervals should be individualized based on clinical judgment, patient risk factors, and established guidelines, rather than an automatic 6-month cycle for all patients. Panoramic imaging (B) at each 6-month recall indiscriminately increases radiation exposure and defies the ALARA principle. Instead, ADA/FDA guidelines (A) emphasize careful selection criteria. Protective measures (C), such as lead aprons or thyroid collars, help minimize dose, and evaluating patient history and current oral health status (D) determines if new images are truly necessary. Following these protocols ensures appropriate imaging frequency for diagnostic benefit without unnecessary additional exposure to radiation.

186. (C) A post-radiotherapy head and neck cancer patient

Radiation therapy to head and neck regions often compromises salivary flow, leading to xerostomia. This shift in oral environment creates a heightened risk of rampant caries, particularly cervical (radiation) caries. Patients (C) may require shorter recall intervals and frequent bitewings or other imaging to detect early decay. Children (B) with low caries risk can maintain a routine schedule, while healthy young adults (A) typically do not face the same risk. An edentulous patient (D) is not prone to coronal caries at all. Recognizing high-caries-risk situations ensures timely radiographic monitoring and preventive care.

187. (B) Decrease magnification and improve sharpness

Intraoral radiographic geometry dictates that reducing the gap between tooth (object) and film (receptor) generally minimizes magnification and helps produce a sharper image. When the object-to-film distance is large, the divergent X-ray beams create a bigger, slightly blurred image. However, because paralleling technique often demands a set distance from the tooth, any small adjustments that bring film closer (if anatomy permits) will lessen magnification. Scattered radiation (C) is more influenced by beam energy, collimation, and tissue thickness. Distortion (D) arises mainly from angulation errors, not necessarily a shorter object-to-film distance.

188. (B) CBCT

A well-defined, multilocular radiolucency in the posterior mandible—such as an odontogenic tumor—often requires more precise evaluation of expansion and cortical perforation. Cone Beam Computed Tomography (CBCT) provides high-resolution, 3D visualization of bony contours, vital structures, and lesion extent. MRI (A) might detail soft tissue but can lack subtle cortical bone definition needed for surgical planning. Lateral oblique jaw views (C) and transcranial TMJ views (D) are more specific for broad mandibular overview or TMJ imaging, respectively. CBCT remains the modality of choice in dental practices for localized bone lesion assessment and planning.

189. (C) CBCT

Cone Beam Computed Tomography (CBCT) captures multiplanar slices of the mandibular molar region, enabling the dentist to measure intrabony pocket morphology and plan surgical or regenerative procedures accurately. While occlusal radiographs (A) can show a broad arch view, they remain two-dimensional. MRI (B) excels at soft-tissue contrast rather than fine bony architecture. A panoramic image (D) gives an overarching perspective yet cannot delineate three-dimensional bone defect contours. CBCT, available in many specialty or even general practices, creates precise cross-sectional data with lower doses than conventional medical CT, providing the detail required for advanced periodontal surgical planning.

190. (B) CBCT

Cone Beam Computed Tomography (CBCT) provides high-resolution views of bone, making it excellent for detecting fine fracture lines in complex post-surgical sites like a maxillectomy region. MRI (A) highlights soft tissue but may not delineate subtle bone fractures as reliably. Sialography (C) is specific to salivary gland duct evaluation, irrelevant in detecting maxillary fractures. Extraoral bitewings (D) are limited to interproximal alveolar details. With CBCT, the dentist or surgeon obtains multiplanar images, ensuring a thorough assessment of fracture extent, graft status, or hardware stability in the maxillary region following tumor resection.

191. (C) CBCT

Cone Beam Computed Tomography (CBCT) is commonly employed in dental clinics for precise three-dimensional evaluation of oral and maxillofacial structures. It provides essential details on residual alveolar bone, maxillary sinus floor, and any palatal defects while delivering lower radiation than a conventional hospital-based medical CT. Water's view (A) highlights maxillary sinuses, not necessarily the oronasal fistula's bony margins. Cephalometric radiographs (B) focus on overall craniofacial relationships, lacking localized 3D data. Traditional dental film tomography (D) is less common and generally provides only a single plane. CBCT thus offers the best balance of detail and dose for surgical planning.

192. (C) Exposure

"Exposure" is the radiological measure indicating the amount of ionization produced in air by X-rays or gamma rays, measured in coulombs per kilogram (C/kg) in SI units. It essentially reflects how many photons strike a given volume of air. Absorbed dose (A) uses grays (Gy) and calculates energy deposited in a material. Equivalent dose (B) incorporates radiation weighting factors to express biological impact, typically measured in sieverts (Sv). Effective dose (D) factors in tissue sensitivities and is also expressed in sieverts (Sv). Recognizing these terms clarifies the distinctions between physical interactions and biological risk measurements.

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193. (A) Parotid gland

Radiation therapy fields for head and neck tumors often include regions where the parotid glands reside, leading to decreased salivary output and xerostomia. Although sublingual (B) and minor glands (C) may also suffer collateral damage, the parotid glands produce a significant portion of serous saliva and lie superficially in the path of many typical radiation ports, making them more vulnerable. Von Ebner's glands (D) are specialized glands near the circumvallate papillae of the tongue, producing serous fluid that helps taste, but they are less commonly implicated in severe xerostomia. Parotid sparing protocols aim to mitigate this side effect.

194. (B) They reduce the patient's radiation dose by requiring fewer photons

Intensifying screens contain phosphors that glow upon X-ray interaction, transforming a relatively small number of X-rays into a larger quantity of light photons. The film, more sensitive to light than direct X-ray photons, is thus exposed more effectively, meaning fewer X-ray photons (lower dose) are needed to achieve diagnostic density. This process doesn't directly increase contrast (A); collimation (C) is done mechanically, not by the screen. The screens convert X-rays into visible light (not the reverse as in D). Reduced photon requirements align with ALARA, limiting patient exposure while maintaining adequate image quality.

195. (B) Restricting the staff member from all radiographic procedures

Pregnant dental professionals can generally continue performing radiographic tasks, provided that radiation safety protocols—like wearing dosimeters, lead aprons, and maintaining distance behind protective barriers—are strictly observed. Monitoring exposure via a waist-level badge (A) helps track fetal dose. Prohibiting a pregnant staff member from all radiographic duties (B) is unnecessary if ALARA measures are respected and likely constitutes discrimination. Keeping lead aprons standard (D) and ensuring barrier compliance and distance (C) maintain minimal exposure risk to both mother and fetus. Consequently, restricting all radiographic tasks is not recommended unless an abnormal dosimeter reading suggests otherwise.

196. (B) FMX typically provides higher resolution per tooth

An FMX series (14–20 periapical films plus bitewings) individually targets each tooth and its periapical structures with minimal distortion, offering higher resolution details. Panoramic imaging (or "panorex") furnishes a single broad overview of both arches in one exposure, but the inherently magnified and somewhat blurred focal trough reduces fine detail, possibly missing small lesions. Panoramic films certainly do include the mandible (D is false). While useful for screening or broad assessments (e.g., impacted teeth, large pathologies), the FMX is more sensitive for subtle periapical pathology, fractures, or early alveolar bone changes.

197. (C) Properly calibrating the digital sensor and machine settings

When adopting a digital panoramic system, proper calibration of sensor sensitivity, exposure parameters (kV, mA), and scan protocols ensures high image quality with reduced patient dose. Extra-thick screens (A) are not applicable to direct digital sensors, while overly low kV (B) risks underexposure and retakes, which increase total dose. Extending scan time (D) can lead to motion artifacts and greater exposure. Correct calibration accounts for the sensor's specific characteristics and the desired diagnostic range, aligning with ALARA by preventing overexposure. Adhering to manufacturer-recommended protocols and performing initial test exposures fosters consistent, optimal performance from digital panoramic units.

198. (B) Ensure the fixer is fresh and films are rinsed thoroughly

Brownish discoloration on developed film signals incomplete removal of residual silver halides, typically caused by depleted or exhausted fixer, or inadequate washing. Fresh fixer ensures sufficient chemical activity to clear unexposed silver salts. A thorough water rinse removes fixer remnants from the emulsion, preventing oxidation and long-term staining. Merely extending development (A) will darken images rather than correct incomplete fixing. Exposing the film to bright light post-fixing (C) can degrade it further. Shortening the wash cycle (D) exacerbates the issue. By refreshing the

fixer solution and ensuring adequate rinsing, film longevity and clarity are maintained.

199. (A) Place a rigid bite block with protective cover and calmly train the child

Child-friendly training paired with a protective sensor holder (or bite block) helps prevent accidental bites and sensor damage. This approach keeps the sensor stable, reduces motion, and fosters cooperation, minimizing retakes. Simply boosting exposure (B) can raise dose without solving biting issues. Extraoral bitewings (C) may not provide the detail required in all pediatric cases, especially for interproximal caries detection in small children. Taping wires (D) might guard the cable but does little to prevent the child from biting the sensor itself. Using a child-appropriate holder system alongside patient education is the ideal solution.

200. (C) Aligning the PID so the beam passes between the first and second molars

Extraoral bitewings capture interproximal areas of posterior teeth for detecting caries or assessing bone levels in patients who struggle with intraoral placement. Properly centering the beam to pass between the first and second molars helps open contacts, minimizing overlap. This approach ensures diagnostic clarity, similar to standard intraoral bitewing geometry. Aiming solely at the mid-sagittal plane (A) is too anterior, while placing film under the chin (B) does not guarantee correct posterior coverage. Rotating the tube 90° from the occlusal plane (D) is unclear and risks distortion. The key is targeting interproximal spaces for accurate imaging.

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